

Contractors and Engineers

magazine of modern construction

FEBRUARY
1956

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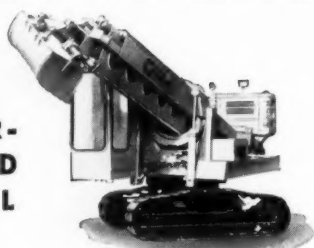


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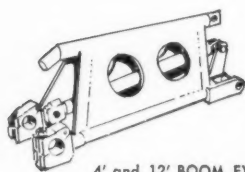
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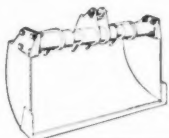


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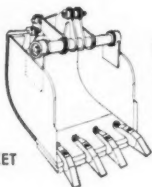
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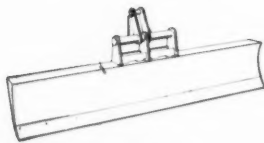
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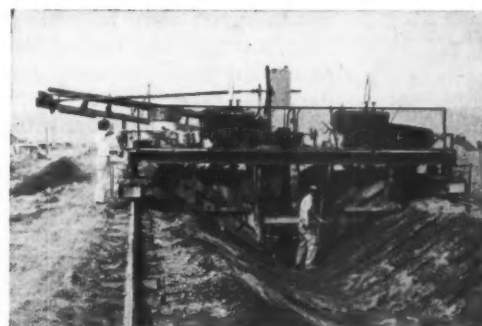
Contractors and Engineers

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Shop-built rigs line small canal.

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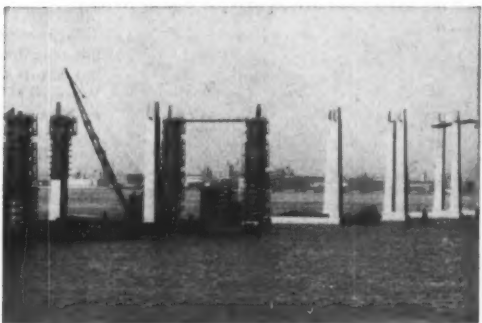
Hammer breaks lip curbs for road widening.

Pg. 74



Puerto Rican homes are mass produced.

Pg. 82



Turnpike bridge piers rise in bay

Pg. 96

New roads from old

Slightly more than a year ago, the state of Iowa had more than 2,000 miles of 18 and 20-foot concrete pavements which were in good physical condition and had reasonable grades and alignment, but were simply too narrow to accommodate traffic safely. Many miles had been built with foot-wide integral lip curbs on both sides, reducing the useable width to as little as 16 feet.

Last season the state embarked on a widening program which, by the end of the 1956 construction season, will have converted at least half these narrow pavements to 24-foot concrete highways. The program for this year includes plans to widen 740 miles of highway at a cost of more than \$12 million—a substantial portion of the state's \$50 million construction program for the year.

The high-speed widening program has been made possible by two developments. The first is a method of removing lip curbs and resurfacing the area once the curbs are removed. The second is an economical method of placing a concrete widening strip, finished smooth and true enough to provide the riding surface without the addition of a bituminous wearing course. After a standard concrete saw makes a cut at the inside edge of the lip curb, a special machine developed in the shops of the state highway department breaks off the lip curb below the level of the slab. Then, in a single pass, a slip-form finishing de-



vice attached to a standard widening machine places and finishes the concrete. Full details of these operations are described on page 74 of this issue.

Liberalizing of the construction specifications, together with a combination of standard and special equipment have helped get the program into high gear. Modified specifications permit a very thin concrete resurfacing to be placed over part of the old slab, permit a slip-form paver to be used, and permit the hauling of concrete in open dump trucks. These modifications have been made without sacrificing quality on the road; the concrete meets the same specifications as other highway work. The finished surface is true to within $\frac{1}{4}$ inch in 10 feet, and the new work has riding qualities at least as good as those of the original slab.

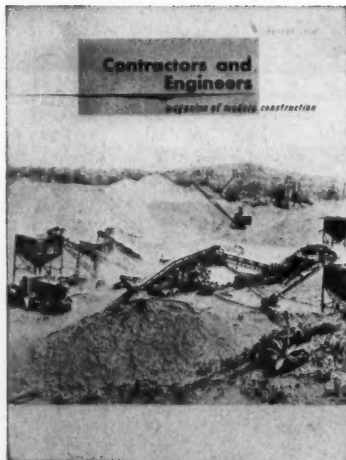
Engineers of the Iowa State Highway Commission, working with the equipment people and the contractors, have brought the method to its present stage of development so that contractors can now remove up to 8,000 feet of lip curb per day and place as much as 10,000 linear feet of concrete widening strip per day.

As construction speeds have gone up, costs have dropped until now the

unit costs of the widening are comparable to the costs of new pavement on a square-yard basis. Bids as low as \$3.88 per square yard were received for a widening strip 3 feet wide and 10 inches thick last season. Average cost of the work is about \$17,000 per mile, and most of the paving work compares favorably with new 24-foot slabs costing several times that amount.

The department's long-range plans once widening is completed, are for a large-scale regrading program that will modernize slopes and ditches and provide an adequate shoulder where the pavement widening has cut into shoulders. When this regrading program is completed five or six years from now, the concrete-widening job will be restudied to determine if a bituminous resurfacing program is necessary.

The apparent success of this bold program may serve as a helpful guide to other states having similar problems. Widening of many miles of dangerously narrow pavements in Iowa is a major accomplishment in making the state highways safe. Similar work can prove the same thing in the national program to improve highway safety.



near 46-VE is being handled by two men, the plant operator, and another man who removes roots and debris from raw material going into the crusher. Page 64

This month's cover shows the crushing and screening setup used by F. S. Ward of Michigan, as he crushes rock to fill three separate orders at one time. The plant produces $1\frac{1}{4}$ -inch-minus rock for base course work; $1\frac{1}{4}$ -inch-minus rock for a hot mix; and $\frac{1}{4}$ -inch-minus rock for precast-concrete sewage components. The portable Plo-

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CONTRACTORS AND ENGINEERS

A truck drives up a ramp, right, to dump pit material to the hopper and grizzly. Processed material is carried to bins and stockpiles, center, then by underground conveyors to the log washer and bin, extreme left.



Conveyor belt arrangement aids rock plant production

Both underground and reversible raised conveyors are used in processing 3,000 yards of material daily

Eleven conveyor belts are being used in the rock plant of R. E. Janes Gravel Co., Inc., Abilene, Texas, where an average of 3,000 yards of sand and gravel are produced in an 18-hour day, three-quarters of it for the Abilene Air Force Base now under construction.

The plant obtains its supply of unwashed gravel from a pit $\frac{3}{4}$ -mile away, where a $2\frac{1}{2}$ -yard dragline loads the material into four 10-yard side-dump trucks for hauling to the crusher. About 2,000 gallons of water are used on the scalping screen, sand screens, and log-washer every minute during plant operations.

At the plant, trucks dump pit material into a hopper and grizzly, and from here the material is carried 80 feet to the scalping screen on a 30-inch-wide conveyor. Sand is given additional cleaning by being washed through two sand screws.

From the scalping screen, the material drops to a No. 1 shaker. Any sand remaining in the material at this point falls through the shaker and is carried by chute to the sand screws. Sand is then carried to a stockpile on a 24-inch four-ply belt, 100 feet long, which has a $\frac{5}{32}$ -inch top cover and a $\frac{1}{32}$ -inch bottom cover.

Minus- $\frac{1}{2}$ -inch gravel dropping out at shaker No. 2 is conveyed 66 feet to a 30-yard bin by an 18-inch-wide Thermoid belt. Material from this bin is loaded into trucks to be hauled to jobs.

All material too large for the No. 2 shaker is fed back to a crusher by an 18-inch Thermoid belt 112 feet long. This crushed material then drops to a 30-inch-wide belt running to the scalper and screens.

At the same time, graded gravel of $1\frac{1}{4}$ inches is taken from the No. 2 shaker on a 24-inch-wide \times 90-foot-long conveyor and brought to a reversible stockpile conveyor. This unit, 66 feet long, discharges gravel to either of two stockpiles.

Material from these stockpiles then goes to the log washer through underground conveyors running in 8-foot corrugated pipe. Log-washed gravel is carried to a rewashing unit and a 60-yard truck-loading bin on a 24-inch-wide belt 100 feet long.

THE END

The New Jersey Turnpike, paved exclusively with a hot-mix asphaltic concrete surface on an asphalt (penetration) macadam base. Traffic averaged 68,000 cars and trucks a day in 1954.



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When the 118-mile New Jersey Turnpike, America's busiest toll road, was paved with Asphalt, the saving as compared to non-flexible paving of the same load-bearing capacity was \$50,000* per mile . . .

An engineering firm which investigated the relative cost of Asphalt and a comparable non-flexible pavement for Massachusetts Turnpike officials, reported that Asphalt would save \$25,000,000 in initial cost, engineering and bonding fees, interest, etc. The State's 123-mile toll road is now being paved exclusively with Asphalt . . .

Oklahoma's Turner Turnpike, between Tulsa and Oklahoma City, was constructed with Asphalt at a saving of \$1,160,000*, compared to the low bid on non-flexible paving.

The economy of Asphalt, so clearly demonstrated by these well-known turnpikes, is typical of savings obtained on street, highway and airport projects throughout the country.

In addition to lower initial cost, Asphalt has a lower upkeep cost, as evidenced by maintenance reports from 7 out of 10 State Highway Departments to the Oklahoma Turnpike Commission.

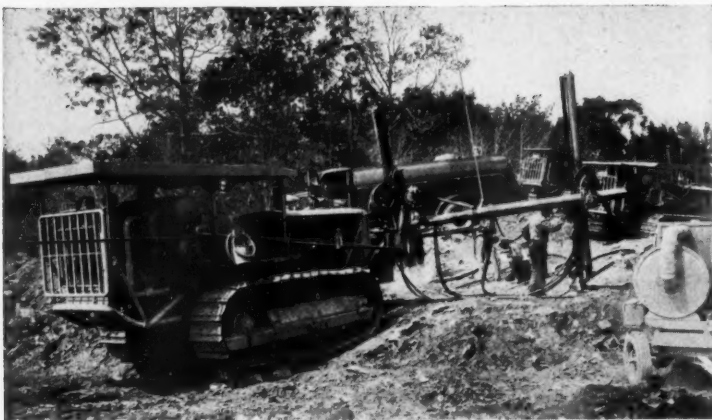
Asphalt's lower cost is especially important to road builders and taxpayers today, when ever-increasing traffic demands that highway dollars deliver the maximum mileage of adequate roads.



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TEXACO ASPHALT

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Cleveland wagon drills, mounted on the front of a Cat D8 tractor and capable of being extended to a 120-degree arc, put down blast holes in a rocky section. Le Roi 600 air compressors, also on the tractor, supply drills with air.

C&E Staff Photos

Diverse work on thruway requires big equipment fleet

Because of the large fleet of equipment at work, construction on a 2.95-mile horseshoe-shaped stretch of the New York portion of the New England Thruway is moving along at a fast clip. Located just south of the New York City limits in the Borough

of the Bronx, this section requires a variety of work, including a bascule-type bridge, pedestrian bridges, and structures as well as the roadway itself.

The short but expensive stretch starts at the intersection of Gun Hill Road and the Hutchinson River Parkway, then extends northwest, parallel to Route 164, before making a circular bend just south of U. S. 1. It then crosses over the Hutchinson River Parkway and continues in a northeasterly direction to the New York City limits.

The first job on the section, substructure work for the 5-span bascule-type bridge carrying the Thruway over the Eastchester Creek, was started under a separate \$2,348,650 contract awarded by the New York State Department of Public Works. The remaining work, consisting of two 36-foot roadways, five structures, and two pedestrian bridges, is scheduled to be completed by the joint-venture of Rusciano & Del Balso, New York, N. Y., by December at a contract price of \$6,500,000.

The joint-venture started work by erecting the five concrete substructures that will carry the Thruway over and under the existing arteries. Because this is a heavily travelled area, the design calls for two 36-foot roadways. Formwork for the substructures, all prefabricated in place throughout the project, consisted of 1½-inch-thick tongue-and-groove lumber backed up with 2×6-inch studs and walers. Richmond ties and bolts are being used exclusively for all formwork.

Concrete was placed by 2-cubic-yard concrete buckets handled by Lorain and Lima truck-cranes. Class A concrete was furnished by Concrete Transit-Mix Corp., New York, N. Y., in ready-mix trucks that emptied directly into the concrete buckets.

With the substructure work complete, the erection of the steel superstructures was started by a subcontractor, the Central Iron Works, Inc., also of New York, N. Y. The 9-inch reinforced-concrete decking will be completed this spring.

Excavation follows

After work on the structures was well under way, the contractor's huge fleet of excavating and hauling equipment started moving about 700,000 cubic yards of rock and earth to bring the roadway to grade. A borrow pit about 5 miles from the center of the project supplies an additional 1,000,000 cubic yards of fill needed to complete grading.

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Short 2.95-mile stretch includes bascule-type bridge; pedestrian bridges, structures, and 36-foot roadways



Broken rock is dumped in a fill area by the Athey PR-21. Rock amounted to about one-third of the 700,000 cubic yards of material that had to be removed to bring the roadway to grade.

All lubricants used are Esso products. Oilers on each shovel take care of everyday lubrication with hand-operated grease guns, and two men from the shop are assigned to patrol the project and lend assistance in

(Concluded on next page)

Of the total amount of excavation, 350,000 cubic yards is rock consisting of a combination of mica, schist, and granite. Drilling in this material was done by 4 pairs of Cleveland wagon drills mounted on the front of Caterpillar D8 tractors. Power was supplied by Le Roi 600 air compressors, which were also tractor-mounted. Equipped with carbide inserts, the wagon drills bored holes as much as 30 feet deep. The two drills on each tractor could be spaced from 2 feet, in a closed position, to an extended position of 120 degrees. Two drill patterns, 4 x 6 and 4 x 4 feet, were used, depending on the rock encountered. Holes were loaded with 40 per cent Du Pont dynamite.

Blasted rock was removed by a P&H 1055 shovel with a 3 1/2-yard bucket and a Northwest shovel with a 2 1/2-yard bucket. Both rigs loaded rock into Athey PR-21 25-yard end-dumps that are powered by Caterpillar DW21 tractors. A total of six Athey PR-21's were on the job, three with a 25-yard capacity, and three with a 30-yard capacity.

A second P&H 1055 shovel, also equipped with a 3 1/2-yard bucket, worked in the borrow pit, loading 30 Mack 12-yard tail-dump trucks. Working around the shovels, substructures, borrow pit, and roadway were several dozers—four Allis-Chalmers HD-15's, four Caterpillar D8's, and a small Caterpillar D4. Trench excavation was generally done with three Lima backhoes, while the substructure excavations were handled by the one Lorain and four Lima truck-cranes. The subgrade was compacted to a 95 per cent density by Jackson vibrating tamper and 50-ton oscillating-wheel rollers pulled by Caterpillar D8 tractors.

Equipment maintenance

All the equipment on this project virtually made it necessary for the joint venture to set up a maintenance shop. Housed in a 35 x 100-foot Butler building, the shop has facilities for a complete overhaul of any piece of equipment. All machines have oil changed at least once a week, except those that have a full-flow filter. The latter equipment sometimes does not require an oil change for as long as three months. Filter elements are being changed approximately every three weeks as long as the oil remains clean. An army surplus GMC lube truck, having six Alemite pump reels, is used for all lubrication done in the field and the shop. There are two reels for grease, and one reel each for motor oil, hoist oil, transmission oil, and air.



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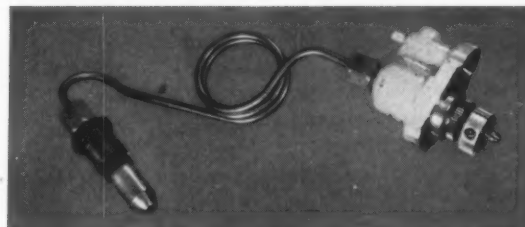
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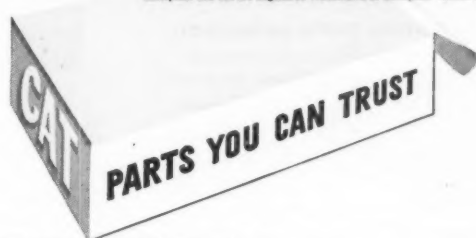
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A 25-yard capacity Athey end-dump, one of three on the job, is loaded with blasted rock by a P&H 1055 shovel with 3½-yard bucket. Three other Athey's, of 30-yard capacity, assisted in this assignment.

C&E Staff Photo

case any equipment breaks down. Foremen also have the responsibility of informing the shop of any equipment failure immediately so that mechanics can be dispatched at once.

In the shop itself are A. O. Smith 300-amp welders, three Ingersoll-Rand Gyro-Flo 600 air-compressors, and four generators—a 5 kw, a 2 kw, and two 3-kw units. Electric power, however, is purchased from the local supply.

When this 2.95-mile, 6-lane section is completed, it will establish an unusual maintenance responsibility that will be handled by three agencies—the New York City Department of Parks, the Borough of the Bronx, and the New York State Thruway Authority.

Paving, for the two 36-foot roadways, scheduled to begin this spring, will consist of reinforced-concrete slabs 9-inches thick. The concrete roadways will be founded on a 9-inch-thick run-of-the-bank gravel blanket and will be separated by a grassed median strip varying from 10 to 100 feet in width.

Personnel

George Wilson is the resident engineer for Madigan-Hyland Engineers, the consultants. Robert Rusciano is the superintendent, and Bill Rusciano, the master mechanic, for the joint-venture.

THE END

Automatic toll collector has recorded thank-you

A new automatic toll collector featuring a thank-you message has been installed at the Raritan Plaza of the N. J. Garden State Parkway. The robot, serving southbound motorists, is on the opposite side of the parkway from the original automatic collector that went into operation last March.

The tape recording attachment "speaks" its thank-you and safety or other messages only to those drivers who have the correct change.

Thew names parts salesman

Don L. Douglass has been assigned to the newly created post of parts sales manager by the Thew Shovel Co., Lorain, Ohio. He will handle the sale and distribution of parts for Lorain power shovels and cranes; also the Byers line of shovels and cranes.

Fairbanks, Morse appoints

C. G. Gehringer has been appointed manager of the scale division of Fairbanks, Morse & Co., Chicago, Ill. He succeeds George C. Worthley, who has retired.

Tishman awards contract for rivetless skyscraper

The contract for the steel framework of an office building to be located at 666 Fifth Ave., New York, N. Y., has been awarded to the Bethlehem Steel Co., Bethlehem, Pa., by the Tishman Realty & Construction Co., Inc., New York, N. Y. This will be the largest rivetless skyscraper in the world.

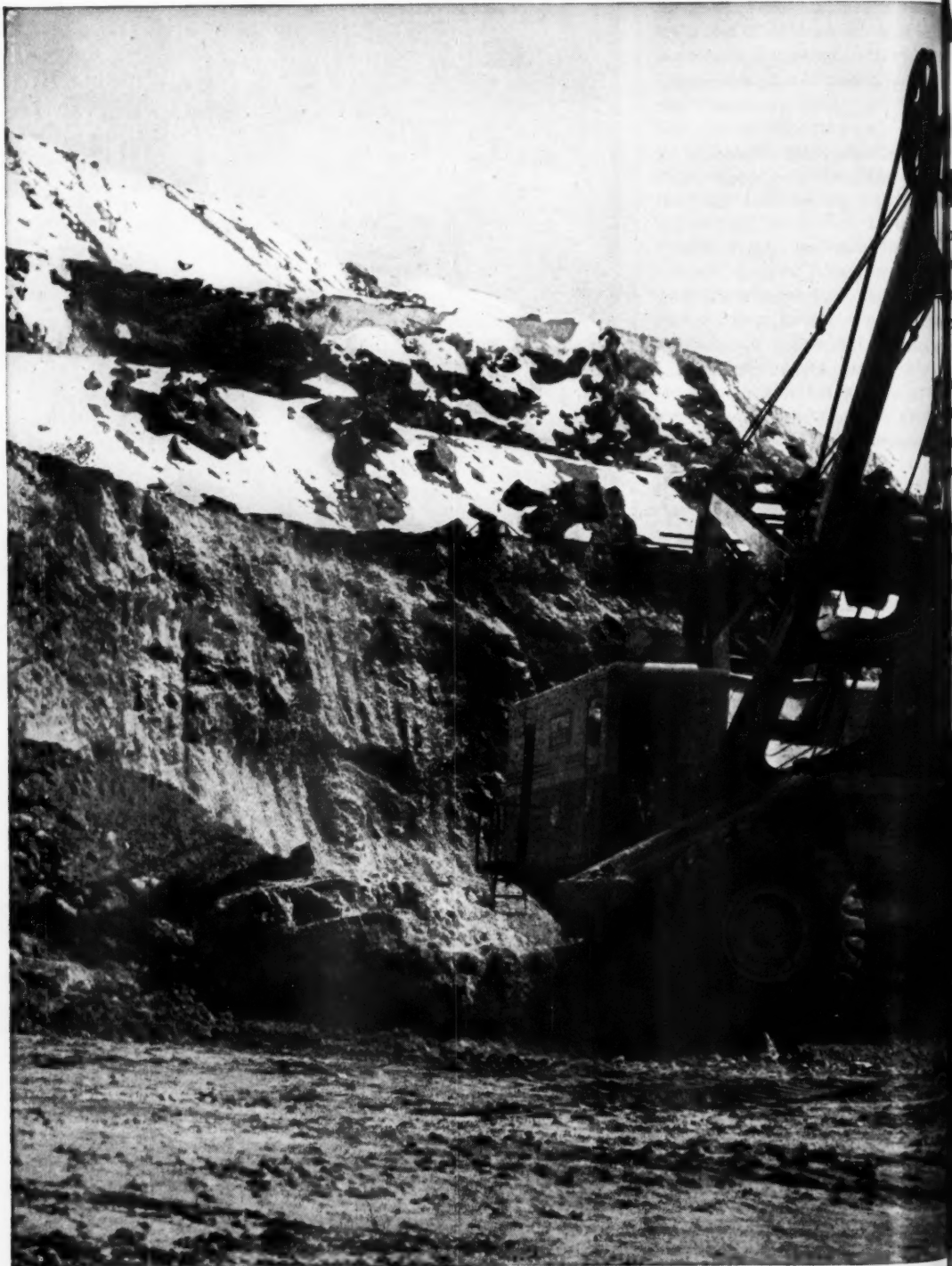
All 13,000 tons of steel in the building will be fastened by the high-tensile bolting method used recently in

bridge and industrial-plant construction.

ASA grants two citations

The American Standards Association has honored Mark K. Wilson, Jr., of the Mark K. Wilson Co., Chattanooga, Tenn., and C. A. Willson of the American Iron and Steel Institute for their contributions in the establishment of voluntary standards. Both men are members of the Standards Council, which is responsible for the technical program of the American Standards Association.

On the council, Mr. Wilson represents the Associated General Contractors of America, and Mr. Willson represents the American Society of Civil Engineers.



TUNE IN:
TEXACO STAR THEATER
starring
JIMMY DURANTE
on TV Saturday nights.
METROPOLITAN OPERA
radio broadcasts
Saturday afternoons.



TEXACO

CONTRACTORS AND ENGINEERS

Working with dozers and rippers, Caterpillar D8 tractors move earth to the Lorain shovel loading dump trucks hauling the material to the break in the Marysville levee. C. W. Lloyd, Marysville, Calif., contractor, was in charge of this work at Cheim Airport.

Round-the-clock fill work helps control flood waters

Millions of dollars were racked up in property damage in Yuba City and Marysville, Calif., as a result of the recent torrential floods, but the total amount would have been even higher if earth-moving equipment had not worked at top speed to repair the 2,000-foot-long and 50-foot-wide breach in the levee on the Feather River.

Bridge washed out

The towns are separated by the Feather River, which, swollen by heavy rains and melting snow, broke through the levee on the Yuba City side and covered the town with 6 to 13 feet of water. The waters also washed out the Fifth St. bridge connecting the towns, tearing a gaping hole in the Marysville anchorage. As most of the 12,500 people in Marysville were being evacuated, the earthmovers went to work.

The one million yards of fill needed to close the break was placed at a rate of 36,000 yards a day by 21 pieces of equipment that included 12 Caterpillar D8 tractors with scrapers and dozers, three Cat No. 12 motor graders, and several wheel-type tractors.

Round-the-clock job

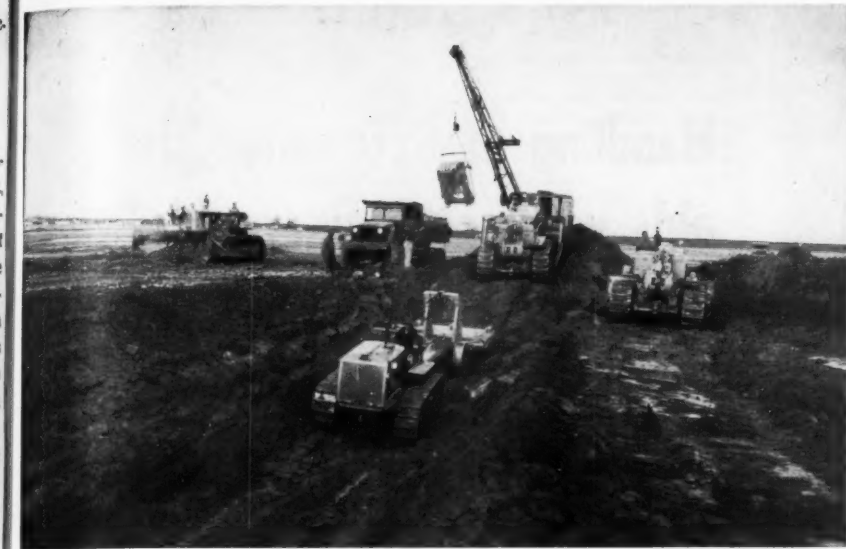
Work on the Marysville side was done on a round-the-clock basis by another fleet of equipment. Locating a dry fill posed a problem until it was decided to remove the macadam from Cheim Airport—a private and unused facility—and make a borrow excavation.

Three Cat D8 tractors with dozers and rippers tore up the site, and a Lorain dragline loaded material into 15-army dump trucks that hauled fill to the site. Altogether, a total of 70,000 yards of fill was required to strengthen the levee on the Marysville side of the river.

Much of the credit for keeping Marysville from being inundated with 18 feet of water goes to the personnel of Beale Air Force Base. Hundreds of men and ample quantities of supplies and equipment were sent to Marysville by air base officials, while the base itself temporarily provided shelter for some 8,000 residents of the community during the time the flood danger was at its height. **THE END**

Sauerman official retires

Louis E. Dierks, a vice president and a member of the board of directors of Sauerman Bros., Inc., engineering and manufacturing firm of Bellwood, Ill., has retired from active service with the company.



When Marfak goes in ... dirt stays out

TEXACO MARFAK keeps bearings clean, seals out dirt and dust. It won't jar or squeeze out, even under heavy shock loads. And Texaco Marfak's tough, moisture-proof film guards against wear and tear. All chassis parts last longer... you enjoy high operating efficiency and low maintenance costs.

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If you want just one lubricant to handle all chassis, wheel bearing, water pump and other grease lubrication—Texaco Marfak Heavy Duty Special 2 is the answer. This new, lithium-base member of the famous Marfak family pumps easily at low temperatures and lubricates effectively over a wide temperature range. It resists water washing,

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Texaco Marfak have been sold**

For transmissions and differentials, Texaco Universal Gear Lubricant EP assures smooth, quiet gear operation—lower upkeep costs.

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A Texaco Lubrication Engineer will gladly recommend the proper lubricants to help you increase efficiency and bring down costs throughout your operation. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 205



This aerial view of the \$19 million Commonwealth Oil Refinery shows the process area (lower left), tank storage area, the causeway extending 6,000 feet into the bay, and the 4,000-foot-long outfall ditch.

Handling of excavation, fill aids work on refinery facilities

Work on causeway, outfall ditch, and earth dikes is complicated by terrain, special local problems

Swamp areas presented the most difficult problems during the building of a causeway and an outfall ditch for the \$19 million oil refinery at Tallaboa, Puerto Rico. But the handling and use of earth excavated in the tank storage area of the refinery helped simplify construction of these first two facilities.

These three phases of the work, along with the construction of earth dikes, roads, tank foundations, drainage facilities, and building foundations, were subcontracted by Lummus Co., New York, N. Y., the general contractor, to Capitol Construction Co., Santurce, Puerto Rico.

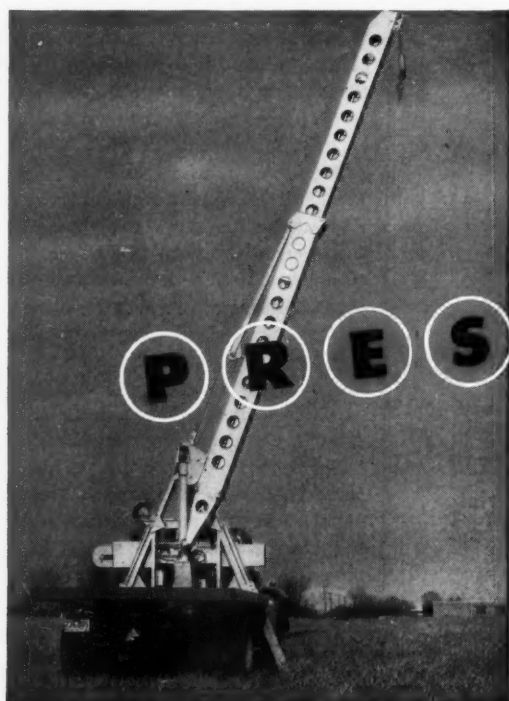
All the refinery work, completed in December, was done by The Commonwealth Oil Refinery Co., a combine of stateside interests to process crude oil imports from South America. The industry will have a 100 per cent tax exemption for 10 years under the government's policy of encouraging industry to build on the island so that better employment opportunities and increased standard of living will result.

Dike building

The storage area, in which the largest tanks were to be erected, was sloped generally, and required about 450,000 cubic yards of earth to be excavated. Of this, about 65,000 cubic yards went into dikes for the 13 large-diameter tanks. About 100,000 cubic yards were needed for the construction of roads and for fill in low areas, and 125,000 cubic yards were used in building the causeway. The remainder was wasted in the swampy tract just south of the storage area.

The fleet of five pull-scrapers that started excavating for Capitol in October, 1954, consisted of Caterpillar 15 and 18-yard units, pulled by two International TD-24 and three Caterpillar D8 tractors. Two Cat D8's assisted by push-loading. These units handled earthmoving for the dikes only. The longer hauls for the 6,000-foot-long causeway were made by 30 dump trucks, which were loaded by three shovels—a Northwest 78 with a 2-cubic-yard bucket, a Koehring 605 with a 1½-yard bucket, and a Northwest 6 with a 1½-yard bucket.

Since the storage area was founded on sidehill cuts, only three walls were required around each tank. Walls extend back to the face of the sidehill cuts, so that each tank is completely



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Hydraulic Telescopic Boom*—Extend and retract boom hydraulically from 17 to 27 feet with full-capacity loads.

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Controls Feature Precision, Safety—Permit inch-by-inch control of every load. Self-centering type, return immediately to neutral if hand should slip from lever.

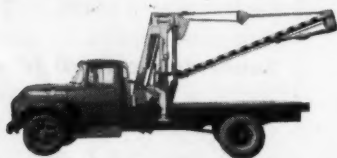
Easily-Installed on Your Truck—Shipped assembled for quick, inexpensive installation on any truck 2 tons or larger.

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every proven feature retained

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*Hydraulic telescopic boom available as optional equipment. Standard tubular boom, shown above, telescopes manually from 12 to 17 to 22 feet.



Hydraulic Telescopic Boom—Adds an entirely separate load-handling "dimension". Move loads away from and toward truck even when obstacles prevent raising and lowering boom. Power loads between closely-spaced beams and through narrow openings where it is virtually impossible to work with any type of standard boom.

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The 4,000-foot-long out-fall ditch is cut through this swampy area, which first had to be hand-cleared of heavy brush. The dragline excavating the ditch worked from a causeway built across the swamp.



Facilities in the process area of the refinery are nearing completion. All erection, handled by Chicago Bridge & Iron Co., Chicago, Ill., used steel shipped from the U. S. to Ponce, then trucked to the site.

enclosed. A common wall separates adjoining tanks.

Tanks are on two levels of cuts, the deepest being approximately 50 feet. About 5,250 cubic yards of rock, drilled with four pneumatic rigs powered by a 315-cfm air compressor and blasted with dynamite, was used in the causeway and road fills.

Fill for the three-sided, trapezoidal-shaped dikes was shaped by two Allis-Chalmers HD-14 tractors until it was no longer practicable for the tractors to ride on top of the fill. A Northwest 25 crane with a 3/4-yard clamshell bucket then brought the dike walls up to designed elevation. A timber template was finally used to dress up the side slopes of the walls and make the 3-foot-wide compacted flat top of the dike.

Causeway extended

Approximately 125,000 cubic yards of fill was needed to extend the 35-foot-wide causeway from the state highway, just south of the storage area, through a swamp section and into open water. Then 1,025 feet out into the water from the end of the causeway, a loading and unloading dock, capable of mooring three tankers simultaneously, was constructed. For this, Raymond Concrete Pile Co., New York, N. Y., drove two 14-inch steel H-piles, 14 1/2 feet apart, every 25 feet for the length of the dock. Bents were completed by welding a 21-inch-wide-flange 68-pound section on the two H-piles. The bent cap is 25 feet long and supports a 10-foot 10-inch concrete roadway. The remaining width of the dock supports pipelines used in loading and unloading operations.

H-piles approximately 125 feet long were later driven through the causeway fill out in deep water for pipeline support. These will prevent undue bending of the lines if there is differential settlement of the causeway fill. These H-piles were also used for pipeline supports because of the severe storms and high water, experienced at times in this section of Puerto Rico, which may wash away the causeway roadbed, bringing about a considerable amount of damage to the pipeline and a loss of oil.

Concrete pedestals were used on the causeway near the shoreline, because it was felt that the fill in this vicinity had been sufficiently compacted by rolling equipment. Material

(Continued on next page)

TWO NEW POWERFUL HUBER-WARCO MOTOR GRADERS

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28,500 lbs.
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25,000 lbs.

Designed to Give the Power and Weight You Want in a Motor Grader

- Powered by GM 3-71 and GM 4-71 diesel engines.
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For a demonstration — see your nearest Huber-Warco Distributor



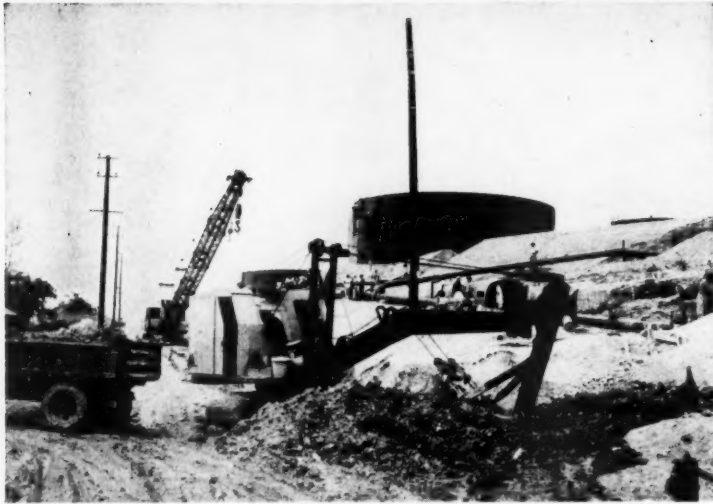
Road Machinery

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 207



(Continued from preceding page)

rial for this area, delivered by dump trucks that backed up and dumped at the edge of the fill, was pushed out into the water by Caterpillar D8 dozers. This gave the fill near the shoreline more of a rolling load than the outermost tip of the causeway fill. Both the pile bent and concrete pedestals were spaced on 38-foot centers along the causeway.

The concrete roadway on the pile-bent dock consists of a 5-inch slab

A Lima backhoe excavates a drainage ditch at the base of the lower row of storage tanks, while a Lima crane works in the background.

sported on two 6-in. wide-flange 45-pound stringers. On each side are 6-inch curbs. The slab was cast in place with 3,500-pound concrete delivered by ready-mix trucks. A batch plant set up at the site by Ponce Ready-Mix Concrete Co., supplied the 10,000 cubic yards of concrete required for the project. From 6 to 6½ bags of cement, manufactured in Puerto Rico, were needed per batch of concrete in order to obtain the 3,500-pound strength required. The large amount of cement used per batch was due to the fact that, with the exception of the river sand near Ponce, sand in this section of Puerto Rico is of a very poor quality.

Outfall ditch

The construction of a 4,000-foot-long outfall ditch to allow wastes from the refinery to be discharged into the water was awarded to Capitol under a later subcontract. This ditch had to pass through swampy terrain overgrown with brush, and all clearing work had to be done by hand since equipment was unable to enter the area and maneuver in the muck.

Once the area was cleared, an earth-fill causeway was extended to the shoreline so that excavating equipment could work from the fill as they dug the ditch along the causeway.

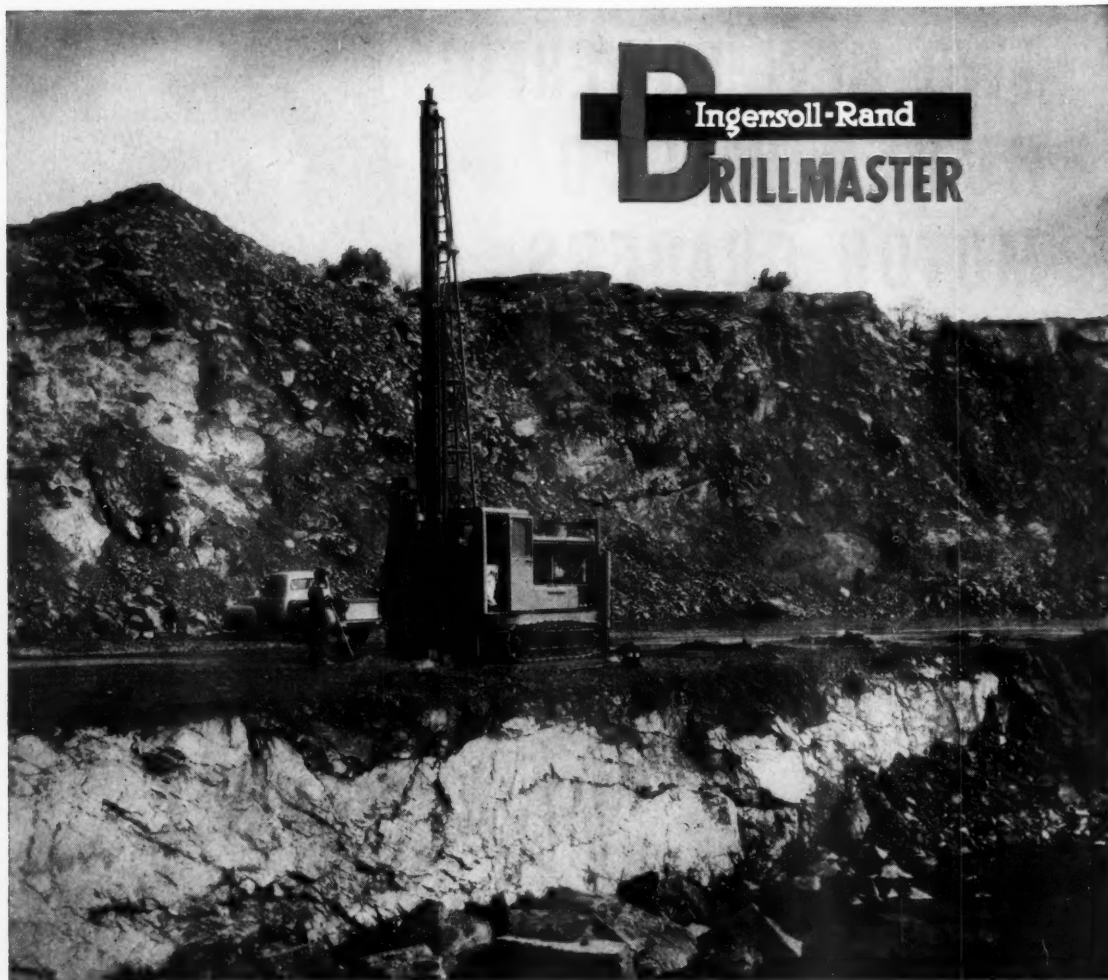
Fill for this causeway came from the 160,000 cubic yards of waste material from the storage area excavation. This was hauled in by truck and pushed out into the swamp by a Caterpillar D6 tractor. After the fill had been extended about 4,000 feet into the swamp, the contractor walked a Northwest 6 dragline with a Hendrix 1¾-yard bucket to the end of the causeway. Then, as the dragline walked back towards the shore, it began excavating a 20-foot-wide ditch alongside the fill, casting the waste in a 180-degree area. The 0.5 per cent slope made in the ditch provided a drop of 1.8-feet between the shore and the end of the ditch.

The bottom of the ditch is almost always under water, the depth of the water varying with the tide. However the ditch slope maintained allows refinery wastes to flow freely toward the natural lagoon that was deepened and shaped to serve as a catch basin for the wastes. As the water level rises in the lagoon, the waste passes through a weir and into the outfall ditch. The weir structure is incorporated into a small concrete bridge that supports an access road connecting the lagoon area with the main refinery and the causeway.

All the steel erection at the refinery was done by the Chicago Bridge & Iron Co. under a subcontract from Lummus Co. Steel was shipped to Ponce from the States and trucked to the job site. Two of the tanks, believed to be among the largest fabricated in place, are 200 feet in diameter and 48 feet high. Others are 150 feet in diameter and 48 feet high, 134 feet in diameter and 48 feet high, and 120 feet in diameter and 40 feet high.

The two largest tanks will be used

CONTRACTORS AND ENGINEERS



increases drilling speed

from 30 feet to 200 ft per 9½ hr shift

Here at a large eastern limestone quarry, the Ingersoll-Rand Drillmaster shown above is sinking 6" blast holes to a depth of 42 feet, at a rate of 200 ft. per 9½-hour shift. Previously, with other drilling equipment, footage averaged only 30 ft. per shift. The Drillmaster Carset Jackbits are giving 5,000 to 10,000 feet per bit, with 500 feet between sharpenings.

The unique "down the hole" Depth-Master

drill, an exclusive Drillmaster feature, goes right down the hole with the bit—avoids power losses in long drill steels and applies the full drilling impact directly to the bit at any depth of hole. The three-way Drillmaster can also be used as a Rotary drill or with the Power-Master "out of the hole" drill when desired.

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for storing a total of 536,000 barrels of Tijuana crude oil. The remaining tanks will be used for incoming and outgoing storage and for processing of different petroleum products.

John Roge was the project manager, and David Henry the site superintendent, for Lummus Co. The Capitol Construction Co., organized 5 years ago, is a joint-venture of Rexach & Rivera Construction Co., Inc., Santurce, and Blythe-Mills Co. of Puerto Rico, Inc., San Juan. This latter organization is a combine of two stateside contractors—Blythe Brothers Co., Charlotte, N. C., and Ralph E. Mills Co., Frankfort, Ky.—formed to handle work on the island. Carl H. Cotter, vice president of Blythe Bros., is in charge of the combine's operation. Henry C. Rexach is the president of Rexach & Rivera, one of the local contracting outfits in Puerto Rico.

THE END

Corps of Engineers' jobs open in New York State

A need for structural, civil, materials, mechanical, construction, and construction management engineers—among others—has developed on civil and military projects in the New York District of the U. S. Army Corps of Engineers. Salaries offered range from \$4,930 to \$6,390 per annum.

Though there is no age limit for applicants, engineers must have from ½ to 2½ years' experience, engineering aids must have 2 to 5 years' experience, and architects must have 2 to 3 years' experience, and construction inspectors for waterways, 2 to 3 years' experience.

Positions are open in New York City, Plattsburgh, and Seneca. Further information may be obtained from the Personnel Branch, New York District, Corps of Engineers, U. S. Army, 111 E. 16th St., New York 3, N. Y.

State lets \$50 million in 1955 for road jobs

While highway contracts valued at more than \$28 million were being brought to completion in North Carolina last year, another \$50 million was being spent by the state for projects on its primary and secondary systems. Work was done on more than 1,600 miles of the primary system during 1955.

One of the longest projects opened to traffic last year was the new expressway section of U. S. 70-29 between Hillsboro and Salisbury. This 80-mile toll-free section, and the new section of the Durham bypass opened in January, gives motorists a 118-mile delay-free road directly into Raleigh.

Allis-Chalmers elects

The board of directors of Allis-Chalmers Mfg. Co., Milwaukee, Wis., has elected Willis G. Scholl to the position of executive vice president of the firm. Formerly vice president of the tractor group, Mr. Scholl will be succeeded in that post by Boyd S. Oberlink.

Atkinson official given safety award

A bronze safety award plaque in recognition of the contribution of Guy F. Atkinson Co., South San Francisco, Calif., to the health and welfare of employees during construction of Pine Flat Dam in California, has been presented to Earl Jennett, vice president of the firm.

The award was presented by John Drenth, San Francisco branch manager of Employers Mutuals of Wausau, on behalf of his firm.

The Atkinson company served as the managing partner in the joint-venture job. Other partners were Bressi & Bevanda Constructors, Inc.; Charles L. Harney, Inc.; J. A. Jones Construction Co.; and A. Teichert &

Sons, Inc. About 600 workers were employed in the construction of the dam, which was completed May, 1954.

Construction firms merge

The McWilliams Dredging Co. and the W. Horace Williams Co., both of New Orleans, La., have merged in order to increase the scope of both companies. To be known as Williams-McWilliams Industries, Inc., the combined organization will not change the personnel, type of activities, or offices of the individual firms.

Robert E. Lamb to build new R. T. French plant

The Philadelphia, Pa., industrial construction firm of Robert E. Lamb

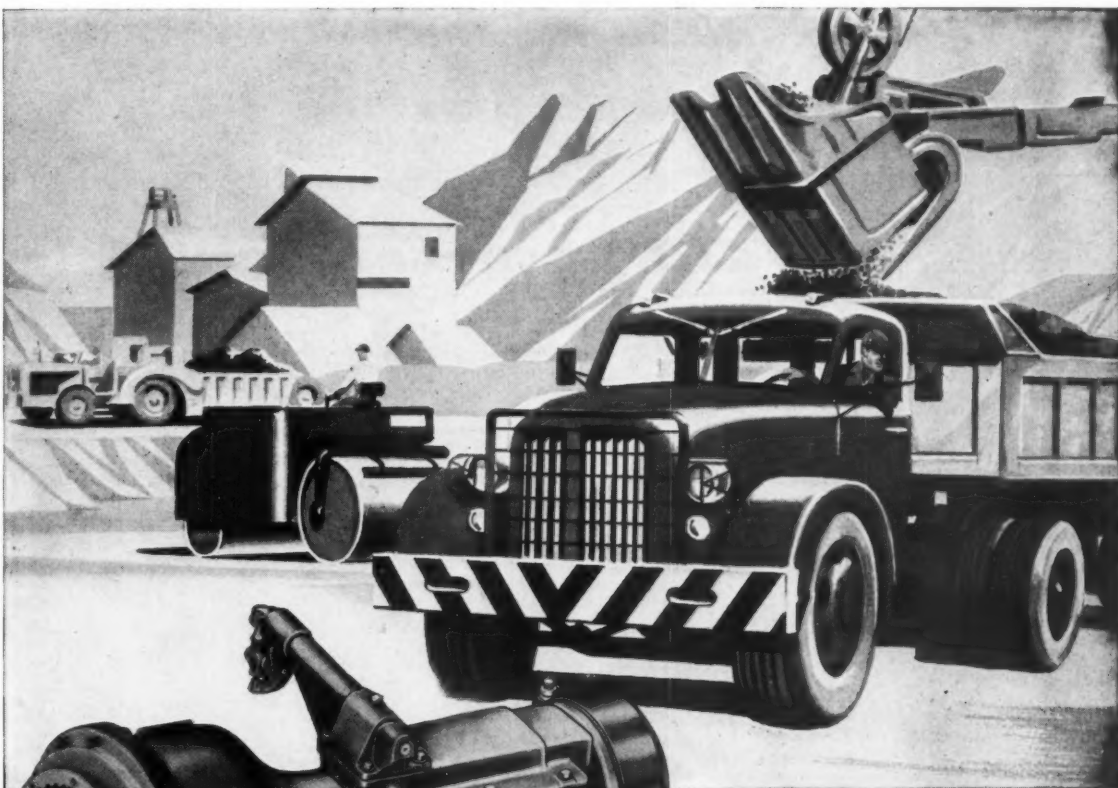
& Son has been selected to design and construct the new plant of the R. T. French Co., Rochester, N. Y.

The plant will be built just south of Souderton, Pa. Costing \$2 million, it will consist of a large one-story warehouse and manufacturing plant.

Designed by Lamb's engineering department for straight-line production, the plant will be completed in the fall of this year.

Pettibone Mulliken Corp. elects new vice president

Wade Meloan has been appointed a vice president of Pettibone Mulliken Corp., Chicago, Ill. With the firm since 1943, he has been treasurer since 1947. Lawrence E. Denman will succeed Meloan as treasurer.



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Less Maintenance
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hp—11" to 26" diameters) assures a size and capacity for every power-transmission requirement.

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Start by sending for the Clark Torque Converter Bulletin—a helpful statement on torque multiplication.



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Please send set of Clark Torque Converter Bulletins.

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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 209

The proposal or bid

by **GEORGE E. DEATHRAGE, P. E.**
Construction Consultant

This is the second of a series of articles on Construction Management by George E. Deathrage, P. E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deathrage & Son., P. O. Box 921, Lakeworth, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent, and who need practical help in order to take complete charge of construction projects themselves.

WHEN AN OPERATOR TURNS CONTRACTOR HE CHOOSES CAT* EQUIPMENT



That's the way it happened with J. M. Dowd, Jr., of Johnston, S. C. He's been in road building since he was 15 years old. Starting as an operator, he became a grade foreman, then a superintendent. Six years ago he bought a Caterpillar D6 Tractor with a Bulldozer and Scraper. Now he has added another D6 Tractor-Scraper unit and a No. 12 Motor Grader and is doing well with his custom contracting. In his own words, "I've always been a Cat owner. Never use anything else."

You can see the kind of work he does in the photo above. This job, near Blacksburg, S. C., called for moving 32,000 cubic yards of earth on a 1.3-mile road project. Cuts run up to 25 feet deep, and the roadway is 32 feet from ditch to ditch. He completed it in exactly two months.

For a good, clean job of bank-sloping or any other kind of grading, the Cat No. 12 is a hard machine to beat. And the new No. 12 Motor Grader is better than ever. Among other improvements it has the exclusive

Caterpillar oil clutch, which reduces wear, can give you 1500 hours without adjustment.

And now tubeless tires are standard equipment at no extra cost. They eliminate an estimated 80% of down time caused by tires. Tubeless tires are easier and quicker to mount, hold air longer, run cooler, and give better puncture and blowout protection.

Your Caterpillar Dealer can show you how to speed production and cut costs with modern, heavy-duty Cat equipment. Depend on him for reliable parts and service, too.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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**99% OF ALL CATERPILLAR
MOTOR GRADERS
ARE STILL AT WORK**

A proposal or bid is made on the request of the owner, or the architect or engineers representing him, and if accepted, it legally binds a contractor to do the work covered. This first step in taking a job is important, for even if a contractor has made an error in his proposal, he cannot ordinarily evade his obligation to complete the work, unless he has the consent of the owner to do so. Any errors in the proposal, any omissions, may make the job a total financial loss for the contractor.

If a bid bond accompanies the proposal, it binds the contractor's surety that the contract will be entered into on penalty of the bond amount. However, the proposal must be accepted without qualification or there is no contract. The law generally holds that a proposal is good for a reasonable time, but may be revoked at any time before it is accepted. Acceptance legally takes place when the proposal is either mailed, or filed in a Western Union office.

There are a number of steps a contractor can take to fully protect himself in case of error, to make sure omissions from the proposal concern unimportant items, and to make sure that the job will be profitable. At all times, he should be sure that the proposal is complete, that it covers every possible contingency.

Authority to make proposals

The superintendent or manager, if acting as an agent for the contractor, has authority to make a proposal and enter into a legal contract for his firm. To avoid misunderstanding, the legal authority of the superintendent or project manager should be made clear to the owner or his representative. But proposals, if possible, should be made in the name of the contractor. Defining the legal standing of superintendent or manager is vital, for even if authority is not expressly given, it may be legally implied from either the acts of the contractor or his representative. State laws vary in this regard, and in cases of doubt, an attorney should be consulted.

Standard AGC form

Though there are many forms of proposals, the owner's representative may prepare his own form, government agencies may require specially prepared forms to be used, larger contractors may insist on using their own forms, and national organizations, such as Shell Oil Co., may require their forms to be used. The American Institute of Architects and the Associated General Contractors of America, Inc., have standard recommended forms approved by many of the trade organizations. No matter what the document used, the contractor should take the time to read it in its entirety. Many times a contractor signs to do work for which no allowance was made in the estimate. In this case, it is too late to do anything after the proposal has been made and accepted.

The standard AIA and AGC forms try to be fair to all parties, but the AIA, representing owners, and the AGC, representing builders, naturally

For more facts, circle No. 210

CONTRACTORS AND ENGINEERS

favor the interests of their respective members. Like other proposals, the AGC form holds the contractor liable for furnishing all materials and doing all work called for by drawings and specifications, and it is good practice to include in the proposal the numbers of all drawings and their dates, as well as specifications by page numbers. This is important since these finally become part of the contract documents.

The AGC proposal takes precedence over the specifications. The latter may demand that the contractor must deepen excavation at his own expense if good bearing is not secured under foundations. This, of course, protects the architect or engineer if soil bearings have not been taken. But the AGC proposal form permits a contractor to take only a limited responsibility if bad ground is found. If additional work is required, the AGC proposal requires that the contractor get extra pay. Of course, the architect or engineer may refuse to accept the terms of this proposal. In this case, some compromise may have to be reached or the clause eliminated.

Other provisions of the AGC form also protect the contractor. If the completed structure violates legal or property requirements, it calls on the owner to defend the contractor for any suit which may be brought against him on this count. The owner is required to pay all fines, damages, or assessments levied against the contractor.

Cover building laws

It is possible for the architect or engineer to try to transfer many obligations to the contractor by stating in a short sentence that the contractor shall be responsible for adhering to all governing laws and ordinances. This means that the building laws of each state and city must be known by the contractor, and particularly the detailed requirements of the building codes. Also, although the architect may have presented drawings and specifications to the city building commissioner, the contractor should make sure that the commissioner has checked every detail to see that the proposed structure meets the building code. Details may not even be shown on drawings submitted by the architect. If the contractor makes sure that every detail has been checked, he can easily avoid the danger that the city inspector may require the work to be torn apart and done again to meet the code. Such omissions will usually taken care of by a first-class estimator familiar with the code at the site of the building. Yet the superintendent and project manager—the responsible parties—should be able to check the estimator to make sure he has done his work properly.

Responsibility defined

The contractor is given further protection by the AGC form, which holds him not responsible for the adequacy of the designs approved by the architect, permits extra pay for furnishing and installing equipment not specified in the contract, and allows adjust-

ments in pay for any alteration in the work. Although the contractor may not be able to secure the acceptance of all the protective clauses covered in his proposal, he should try to secure as many as possible. His only alternative protection is to make sure that items not specifically covered in the proposal are allowed for in his cost estimate.

Since architects and engineers do not always abide by the clause stating that the contractor shall get extra pay if suitable foundations for all footings are not found at depths indicated on the drawings, this item must be carefully considered by the estimator. In some cases, the contractor may qualify his bid, stating that if proper bearing is not found at shown depths, he shall be paid extra for the additional

work, even though architects' specifications state otherwise. Another clause in the proposal states that if there is any dispute concerning workmanship or material which has been vaguely defined in the drawings and specifications, the dispute shall be settled by mutual agreement.

In the event of conflict between the contract documents, the proposal states that the general specifications of the contract shall have precedence over general drawings, unless specifications are ambiguous or unintelligible. Detail drawings take precedence over both general drawings and general specifications, and detail specifications take precedence over all drawings and general specifications. Thus, if details furnished during the course of the job do not conform to

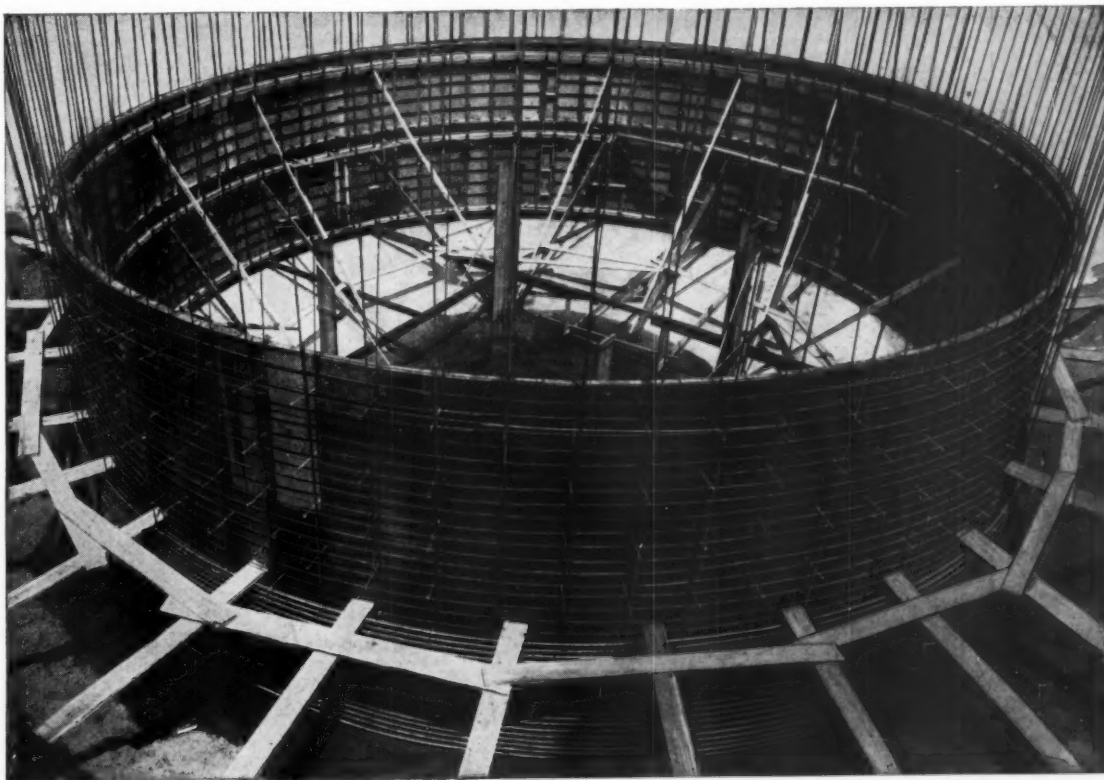
general drawings and specifications, and an extra is called for, a written change order can be issued authorizing the extra expense.

Though the contractor guarantees his work against defect for only one year under this proposal, he can, on request, furnish manufacturer's guarantees to the owner.

Important protections

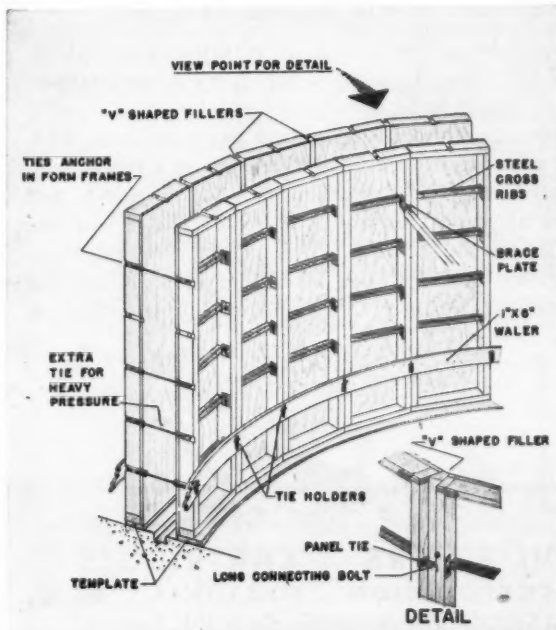
Tornado, hail, and earthquake insurance must be maintained on the structure and all materials used in the work. To make sure of their own protection, contractors should see to it that they get copies of policies taken out by the owner. Insurance should also cover his own tools and equipment and those that are the

(Continued on next page)



Setting Up Forms for Sewage Disposal Tank, St. Louis County, G. L. Tarlton Co., G. C.

SYMONS FORMS for CURVED WALLS



Symons Rib panels are used with V-shaped fillers at each joint. Sturdy wedge-bolts secure the three pieces together and also hold the ties in place. Curved walers (see photo) or 1" x 6" flat walers (see perspective) may be used for alignment.

Contractors report savings of \$5000.00 on forming costs of Sewage Disposal Plants. Engineers are well pleased with the smooth finished walls.

Symons offers a complete engineering service to solve your toughest forming problems. Send us the plans for your next job and a complete layout and cost sheet will be furnished without charge.



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personal property of his workmen.

Unless the contract states a definite amount of damages for delay in completing the work, the proposal specifies that the owner shall waive all claims for damage against the contractor. Liquidated damage clauses are largely becoming a thing of the past now, since it is hardly fair to assess a penalty for delays without paying the contractor a bonus for saving time on the work. If such a clause is contained in the contract, a daily report of job progress, noting weather conditions, should be kept up to date so that the actual number of days worked is recorded. If the owner has a representative on the site, his

signature on the statements may avoid a great deal of argument later on.

The AGC proposal also covers progress payments, which are usually billed in the amount of 90 per cent of the value of work performed and materials delivered, leaving 10 per cent to be paid at the end of the job. Billing should include all extras and the contractor's overhead and profit. If this is not included, the retained percentage may run to 25 or 30 per cent and more.

The AGC agreement also holds the contractor not responsible for work performed by other contractors, or for devices required by other contractors, unless this item is stipulated in the specifications. Many times, the contractor is expected to coordinate work

on the site without being paid for it. The only way to meet such a situation is to secure a written and signed authorization for extras that may develop.

If the proposal is accepted, it becomes a part of the contract agreement, the general conditions of the contract, the specifications, and the drawings. All these comprise the contract documents.

Shorter forms

A shorter proposal form is modeled after that of the American Institute of Architects, and is designed to be used in conjunction with their standard contract form and general conditions of the contract. It does not include all the qualifying clauses of the AGC form, and does not become part

of the contract documents. This form includes only enough statements to affect a minimum proposal, and additions usually have to be made to it. Clauses concerning time limits, liquidated damages, bond, and alternate proposals, have to be inserted.

In many cases, the superintendent or project manager may come across contracts amounting to only a few hundred dollars. These have to be prepared hurriedly, and a short form of proposal usually serves the purpose well. Such a form merely describes the work appearing on drawings and in specifications, lists the drawings by number, specifies the amount to be paid for the work, and the basis of pay.

Sometimes, a small job may be done for a firm which issues a purchase order for the work. Many of these have the general conditions covering required insurance and other general conditions printed on the back of the order. In this case, a simple letter of proposal, stating the job to be done and the amount to be paid, can be prepared by the contractor. If the contractor prepares a sketch of the work to be done, the letter or proposal should be worded to state this fact. Several prints of the sketch should be attached to a proposal for small work. Notes on the drawing may cover all specifications required.

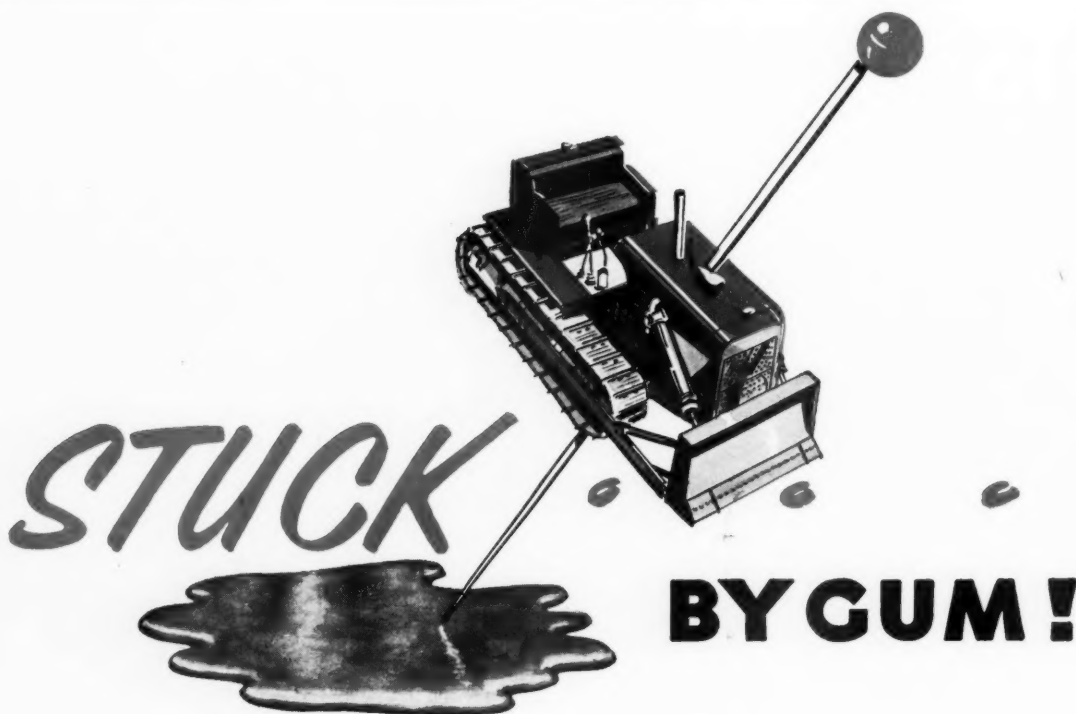
There are many types of standard proposals on the market in printed form and these inexpensive forms can be extremely useful. They are simple, to the point, and easy to prepare. However, they may prove dangerous since they leave many items unsettled.

Other forms

All the proposals so far have been based on the assumption that the architect or engineer has prepared drawings and specifications for the job. It is common practice, now, for the contractor to prepare these. In this case, a different kind of contract, including both design and construction, must be prepared. None of the standard documents of the AIA or the AGC cover this situation. If they are used, so many changes, and erasures will be necessary that it would be wise to use an entirely new form of proposal.

Two methods can be used. One is to have a separate contract for the architectural or engineering work, followed by a separate proposal and contract for doing the work. The other method is to create a type of combination proposal and contract covering design and construction, which merely has to be accepted by the owner to make a contract. The AIA has available standard forms of agreement between the owner and architect that can be used for architectural or engineering work. These are "The Standard Form of Agreement Between Architect and Owner—When a Percentage of the Cost of the Work Forms the Basis of Payment" and "Agreement between the Owner and the Architect—on a Fee-Plus-Cost System."

If there are no drawings and specifications and the work has to be done fast, a specific and different combina-



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Call your nearest WIX Jobber,
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tion proposal-contract is required. A typical one stipulates that the contractor act as engineering, construction, and purchasing agent, leaving full control of all work, and the selection of materials and equipment to the owner. Subletting parts of the work and determination of wages and hours are also left to the discretion of the owner.

This type of contract is often used by large firms that design and construct plants. The proposal-contract resembles the AIA service-type of contract and demands a systematic and routine method to be followed in handling all purchases, receipts, payrolls, other disbursements, and the submission of drawings and specifications for the owner's approval.

Proposals on work for government agencies must generally be made in triplicate on forms supplied by the agency. If the proposal or bid exceeds \$2,000, a bid bond must accompany the bid or proposal in the amount specified on the invitation for bids. Governmental agencies supply all forms required.

Bids on private work

The AIA has several typical invitations to submit a proposal and forms of instructions to bidders, which many architects use. Proposals must be made on the forms provided, and should not contain a recapitulation of work to be done. Before submitting a proposal, bidders should examine drawings and specifications, visit the site of the work, inform themselves as to existing conditions, and include in the proposal a sum to cover the cost of all items. The instructions to bidders and the proposal forms should be read carefully, since they sometimes obligate a contractor to do something which he has not taken into consideration and which has not been taken into account in the estimate. Particular attention should be paid to bulletins or addenda sent out after the invitation has been mailed. These are sometimes not received by a contractor. In this case, it is a safe practice to state the number and date of the last addendum received in the bid or proposal.

The practice of architects to demand the return of drawings and specifications with the bid often leaves the bidder with no record of either. It is good insurance to hold drawings and specifications until the award is made, using this set as the basis for the contract. This protects the contractor in case revised drawings and specifications have been sent out and the contractor has not received them.

The bid bond, which guarantees that the contractor will enter into a formal contract if his bid is accepted, is not always used. Sometimes a certified check has to be forwarded along with the bid, and this becomes forfeit if the contractor refuses to do the work. A surety bond or performance bond, is requested, costing the contractor about one per cent of the contract price, should be allowed for in the job estimate. Government agencies have their own form of bid and surety bonds, copies of which must

accompany each copy of the bid or contract.

A proposal made and accepted becomes a contract. For this reason, all precautions should be taken to protect a contracting firm. Some of the more important items to remember in making a proposal are:

1. Agreements made on Sundays are generally void by statute.
2. Use the exact names or legal titles of the parties, and their addresses.
3. Use the name of each partner, as well as the name of the firm. In the case of a corporation, use its exact title, followed by a statement as to the place of its incorporation. If dealing with a voluntary association, insert the names of the officers and some responsible members so that all be-

come personally bound by their signatures.

4. Make sure that signatures agree exactly with the names of the parties as written in the agreement.

5. The name of a corporation should be followed by the signature of an officer authorized to execute a contract. The attachment of a seal is a necessary part of the legal execution of a contract by a corporation.

6. In doing business with a corporation, make sure it has the right to enter the proposed contract, that it has exercised that right by legal action, and that the officer executing the contract has been duly authorized to so act by the corporation.

7. Contracts with authorities assuming to spend public money, or voluntary groups, are so charged with

danger that it is wise to consult an attorney on the final draft.

8. Witnesses to the signing are not necessary. Signatures may be proved by competent evidence. Witnesses are of use only when one of the parties claims his signature to be a forgery.

(Next month's article will deal with "Contract Documents — Contracts, general conditions, plans and specifications.")

Steel shipments growing

An estimated 3,300,000 tons of fabricated steel work is expected to be shipped to customers this year. This is a 12 per cent increase over 1955 shipments, which in turn were up 15 per cent from the previous year.



4-wheel-drive PAYLOADER® gets around!

The quick acceptance and success of the 4-wheel drive tractor-shovel probably has no parallel in construction equipment history. Pioneered and first introduced by Hough in 1948, this type of machine is numbered in the thousands among contractors, pits and quarries, public bodies, mines and industry.

Hough leadership and pioneering in the 4-wheel drive field continues and is presently represented by three new "PAYLOADER" sizes — all incorporating the "know-how" and new features that result in better performance — more production, easier and faster — at lower net cost.

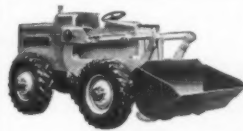
All three have powerful pry-out action and 40 degree bucket tip-back at ground level to dig faster, get bigger loads and carry bigger loads — safely. All three have more powerful engines — a choice of gasoline or diesel — and many other more-yardage features.

Your "PAYLOADER" Distributor is eager to show what these new units can do — for you.

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2 cu. yd.



**MODEL
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Send full data on new 4-wheel drive "PAY-
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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 213

Flexible methods aid finishing of hardened concrete surfaces

One of the light Bayflex 7-inch abrasive disks, running at 3,400 rpm, is used with a Stow No. G40-C flexible-shaft grinding unit to remove fins and form marks from the exterior wall of a new office building.



When specifications call for finely finished concrete surfaces—on walls, columns, ceilings, or even floors—contractors generally turn to the use of either dry grinding or wet rubbing methods. Some still use a concrete vibrator, with a geared right angle head and disk or grinding wheel substituted for the vibrator head. This technique, however, has obvious drawbacks, the biggest one being that it ties up vibrators that may be needed elsewhere. Hand rubbing bricks are used rarely these days, since the method is slow. When large areas have to be finished, they almost require that machines be used.

Dry grinding

Dry grinding removes fins and marks caused by forms. Formerly, resinoid abrasive cup grinding wheels were used for this work, but the abrasive disks that have been developed do a good job and have the advantage of being lighter in weight.

These disks, are made up of multiple layers of abrasive-impregnated cotton fiber material bonded together under heat and pressure with a strong resin bond. A silicon carbide abrasive, found to be the best for concrete, is used. These disks, usually about 1/4-inch thick, come in 7 or 9-inch-diameter sizes. They can be attached to any type of portable tool. Functioning best at 3,000 to 4,000 rpm, they can be applied to the surface at an angle of about 30 to 40 degrees, while their weight provides the needed pressure.

Wet rubbing

Wet rubbing smooths green concrete to a plaster-like finish. The rubbing action of a slow speed grinding wheel or disk while water is applied to the fresh concrete has the effect of bringing up a wet material that results in a smooth concrete surface. The grinding wheel or disk has a right angle head, which has various gear reductions to bring the grinding speed to 300 to 500 rpm. The wet angle head comes with an attachment for a water hose so that water can run through the center of the grinding wheel onto the concrete. A button on the angle head allows the operator to apply water and grind simultaneously.

A technique similar to the wet rubbing method permits air holes to be filled and a smooth surface obtained on dry concrete. A coating of wet concrete is applied over the surface first with an ordinary hand brush. Then it is brushed in, water being applied as necessary.

Special resinoid bond abrasive cup grinding wheels with a silicon carbide abrasive are available for wet rubbing. Usually the 4 1/2 and 6-inch-diameter sizes are used.

Relatively new is a disk with a waffle pattern. These have fiber backing through which nylon loops have been sewn to provide a strong adhesion between the silicon carbide abrasive section and the backing material. The waffle pattern makes the disk hug the work surface and clears the freshly ground particles off the work and out of the disk. This type of disk works best when it is applied to the surface at an angle of about 5 degrees.



"FORD POWER STARTS QUICKLY

hangs on

to heavy loads — doesn't hesitate a bit!"

says FREDERICK VOLK, Fox Point, Wis.

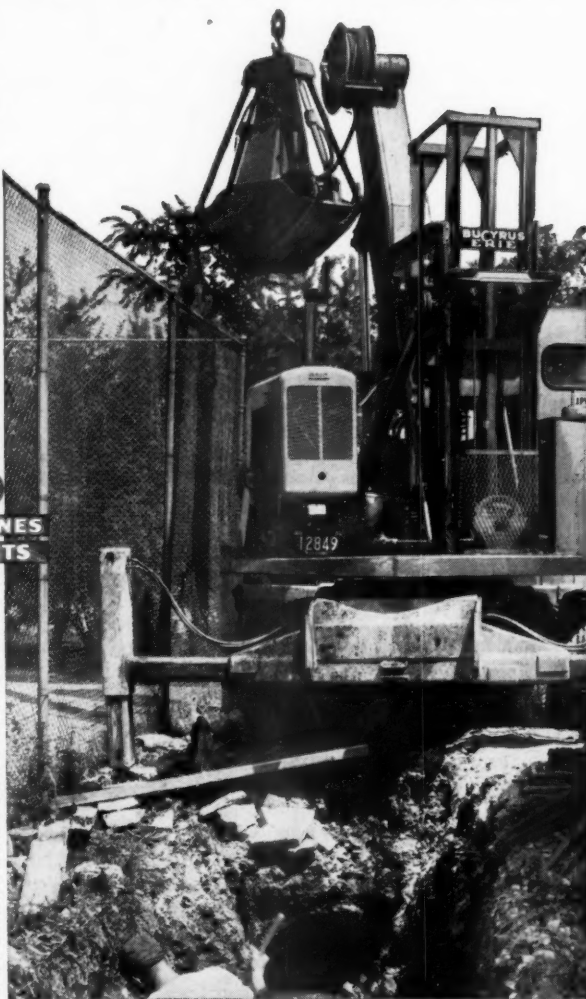
"We handled approximately 60 cubic yards in close quarters with the clam shell in about three hours work. We were digging a drainage trench for a 42" culvert and had to go around various obstacles including trees and a 12-ft. fence to swing the clam over with the load. I like the Ford power of this Hydrocrane because it starts quickly—hangs on to heavy loads and it doesn't hesitate a bit!"



The Bucyrus-Erie Model H 3 Hydrocrane that Mr. Volk operates for the village of Fox Point is powered by a Ford "172" industrial engine. Built for versatility, mobility and economy, the Hydrocrane gives precision control through a hydraulically operated closing bucket and a variety of attachments. Upper deck revolves 360° with telescoping high-lift boom capable of from 30- to 38-ft. full load length. Hoist rams provide free line speed of up to 190 f.p.m. with 6,000 lbs. line pull. Ford Industrial Engines can provide similar power plants for all the major types of construction equipment.

It will pay you to specify Ford engines on your next piece of equipment because Ford is the only industrial engine manufacturer to offer modern Short Stroke design in a full line of overhead-valve 4-, 6- and 8-cylinder engines. These engines cut piston travel and piston speed which reduce friction and wear. The result is more usable power and extended engine life. This means you get jobs done quicker and more economically.

Right down the line . . . from the 134- and 172-cu. in. 4-cylinder engines . . . to the powerful 6-cylinder 223-cu. in. engine . . . and the big heavy-duty V-8's of 272 and 332 cu. in. displacement, you'll find Ford engines are years ahead in engineering. Engines that are designed to give power-packed performance more economically and for a longer period of time.



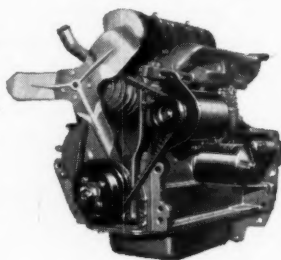
Autothermic pistons help maintain proper piston-to-wall clearance and prolong engine life.

Large overhead valves of high chrome-nickel alloy improve volumetric efficiency, resist warping.

Free-turn intake and exhaust valves reduce the possibility of valves sticking, help maintain compression longer.

Iron Alloy sleeves are centrifugally cast for better heat transfer and wear characteristics plus longer cylinder wall life.

FORD "172"



For detailed information, phone or write today to:

INDUSTRIAL ENGINE DEPT., FORD Division of FORD MOTOR COMPANY, P.O. BOX 598, DEARBORN, MICH.

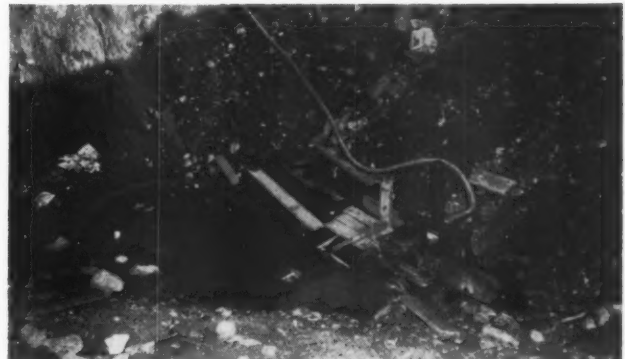
For more facts, use Reader-Reply Card opposite page 18 and circle No. 214



Marlow Mud-Hogs work on a deep lift where the sewage line tunnels under a road.



La Fera used this Marlow Mud-Hog to dewater a ditch 25 feet below grade in which an 84 inch sewage pipe is being laid. Constant seepage at this point made it necessary to run the pumps 24-hours a day to keep ahead of the water.



Almost buried in mud, this Marlow Mud-Hog pumps efficiently near the site of the second sewage plant being built for the Jersey City Sewage Authority by the La Fera Contracting Company of Newark, New Jersey.

Marlow Mud-Hogs Solve Major Seepage Problem

Rugged pumping conditions on \$30,000,000 sewage project

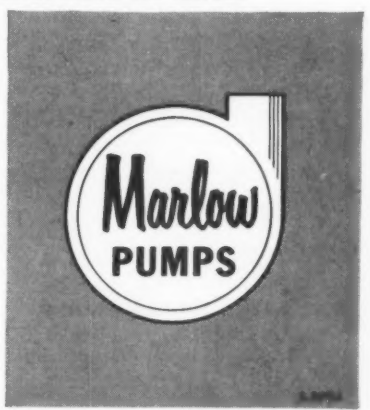
Garden State Constructors are currently working on a \$30,000,000 project to extend sewage facilities from Bayonne to Secaucus, N. J., for the Jersey City Sewage Authority. There are two plants and two main trunk lines feeding these plants that are involved in this job. Work has been under-way for a year and will continue through 1956.

La Fera Contracting Co. of Newark, N. J., one of four contractors united in this joint venture, is handling the west side pipe line construction. They are installing approximately 25,000 feet of 42" to 84" pipe. Cuts run as deep as 30 feet below grade and all are below the Newark Bay sea level.

La Fera selected Marlow Mud-Hogs and used them 24-hours a day with minimum service interruptions and trouble. Frank Grosso, Equipment Superintendent, said, "We use Marlow Mud-Hogs because we found they out-performed all others." Over 15 Marlow Mud-Hogs are being used by La Fera. Other contractors on the same job are using about double this amount.

Because the pumps have performed so effectively, the job has run ahead of schedule, despite the constant water problem. Pep Rizzolo, La Fera Master Mechanic, said, "You can't beat Marlow Mud-Hogs for hard pulls involved in deep hole work such as we are doing now."

For a tough dewatering job you can depend on Marlow Mud-Hogs. They take all kinds of abuse and pass trash and debris without clogging. Write today for complete information.



MARLOW PUMPS
Division of Bell & Gossett Company
RIDGEWOOD, NEW JERSEY
Morton Grove, Illinois Longview, Texas

For more facts, use Reader-Reply Card opposite page 18 and circle No. 215

names in the news



James L. Meadow, who recently joined the Portland Cement Association.

Former editor joins staff of Portland Cement Assn.

James L. Meadow, former editor of *Construction News Monthly*, a regional publication of Little Rock, Ark., has joined the public relations department of the Portland Cement Association, Chicago, Ill. He will work in the highway and municipal bureau of the organization, a research and informational association.

Army Corps of Engineers reassigns officers

New assignments for four engineer officers have been made by the U. S. Army Corps of Engineers. Col. William J. Ely, district engineer at Sacramento, Calif., since July, 1953, has been assigned to the U. S. European Command. Until a successor is named, Lt. Col. Alvin D. Wilder, Jr., the former assistant district engineer, will serve as acting district engineer for Sacramento.

Stepping in as acting district engineer at Tulsa, Okla., is Col. William J. Himes, former assistant district engineer. He will hold the post until a successor is named for Col. Stanley G. Reiff, who has been appointed chief of the Technical Liaison Division, Office of the Chief of Engineers.

Col. Delbert B. Freeman, technical liaison division chief, has been assigned to the Army Language School, Monterey, Calif., prior to an assignment in Latin America. The former district engineer at Tulsa, Okla., Col. Stanley G. Reiff, will become the new chief of the division.

Kidde division elects Shannon vice president

Gerard T. Shannon has been elected vice president of Walter Kidde Engineers Southwest, Inc., Houston, Texas, a division of Walter Kidde Constructors, Inc., of New York, N. Y.

In addition to his new duties, Mr. Shannon will continue as general manager of the southwest office of Walter Kidde Constructors.

New York State appoints

The former assistant district engineer in the Albany district office of the New York State Department of Public Works, Newton F. Ronan, has been appointed public works superintendent of operation and maintenance. Mr. Ronan has been associated with the department since 1911.

Charles B. Spencer dies of heart ailment

Charles B. Spencer, engineer and constructor, died at his New York, N. Y., home on January 7. He was 69 years old.

Mr. Spencer was chairman of the board of Spencer, White & Prentis, Inc., New York construction firm, and of Spencer, White & Prentis of Canada, Ltd. A member and past president of The Moles, an association of heavy-construction men, he won The Moles award for distinguished service to the construction

industry in 1950.

A graduate of Columbia College and Columbia Engineering School, Mr. Spencer constructed the foundation for the Cleveland Union Terminal, believed to be the world's deepest. He also constructed portions of the Sixth and Eighth Avenue subways in New York City, and did the foundation and steel work in the renovation of the White House in 1949.

During World War II, Spencer participated in the construction of dry-docks, in Philadelphia and Norfolk, airfields in the Bahamas, and rail-

road and port facilities in Iran. He had served as a captain in the army during World War I.

District engineer joins Asphalt Institute staff

James C. Johnson, district engineer of Oklahoma City, Okla., has joined the headquarters staff of the Asphalt Institute, College Park, Md. He will work directly with chief engineer Arvin S. Wellborn on special problems in asphalt engineering and soil stabilization.

A graduate of Oklahoma A & M

CAT* DW21 - NO. 470 LOWBOWL SCRAPER OUTLOADS COMPETITION IN ON-THE-JOB TESTS ON KANSAS TURNPIKE

1. TESTS WERE MADE on contractors' jobs on the Kansas Turnpike. They covered a period of three weeks. For each comparison, the competing units were loaded under similar conditions. Soil density tests were performed right in the loading area to provide an accurate measure of scraper load in pay yards.



3. JOB STUDIES showed that the new turbocharged 300 HP DW21 Tractor had the "go" to equal or beat other units in cycle time while carrying more pay yards. Other features contributing to this unit's success were large 29.5-29 tires, an efficient power train, synchro-safe brakes and the fast, responsive No. 27 Cable Control.



2. FIELD ENGINEERS weighed load after load as competing units passed over a portable platform scale, subtracting average empty weight from average gross weight they determined average net load weight. In every test the No. 470 Scraper with exclusive Caterpillar Lowbowl design consistently carried larger payloads.



4. LOWBOWL DESIGN, developed by Caterpillar, is a feature of the No. 470 Scraper. With this new concept, bowl has been widened and lengthened, yet its depth has been decreased. But Lowbowl design is more than just dimensional changes. As the tests show, material is loaded with less resistance clear out to the end of the loading area.





James C. Johnson, recently joined the headquarters staff of the Asphalt Institute, College Park, Md.

College with a bachelor's and master's degree in civil engineering, Johnson has been with the Institute since 1951. He is a member of the American Society of Civil Engineers, the Highway Research Board, the American Road

Builders' Association, and the Association of Asphalt Paving Technologists.

George H. Dent joins Maryland engineering firm

George H. Dent has joined the staff of the Benjamin E. Beavin Co., Baltimore, Md., consulting engineering firm. He is also assistant chief engineer of The Asphalt Institute, College Park, Md., and president of the Association of Asphalt Paving Technologists.

After graduation from the University of Maryland, Dent served with the Maryland State Roads Commission and introduced at that time the first mobile soils laboratory. He joined The Asphalt Institute after a period as paving engineer with the Civil Aeronautics Administration. During the past year, Dent has been closely associated with the experimental asphalt groin installations at Ocean City, Md.

As a student of shore-erosion problems, he is a member of the American section of the Permanent International Association of Navigation Congresses.

Asphalt Institute votes 1955 achievements, plans educational program

The 45 low-cost asphalt groins at Ocean City, Md., which last fall successfully weathered the poundings of hurricanes Connie and Diane, have been voted the most outstanding asphalt engineering feat of 1955 by the staff engineers of The Asphalt Institute.

Taking second and third place, respectively, on this list were the Garden State Parkway in New Jersey and the new asphalt-base construction program in North Carolina. The 165-mile parkway was cited for its safety record, the fatality rate in the first full year of operation coming to less than one per 100 million vehicle miles. The national average is 6.5 deaths per 100 million vehicle miles.

Runner-up projects included the 2,045-acre-foot asphalt-lined Silver Lake reservoir in Los Angeles, Calif.; the widening of the New Jersey Turnpike; and the construction of the Ford asphalt test track at Kingman, Ariz.

While taking a backward look at past achievements, the institute has been busy with programs for the future. One of the most important is the educational program, mapped out by the committee on educational aid, which has been designed to attract more men into the field of civil engineering. Currently, the program include a \$19,630 grant for a summer study program this year at the Purdue University School of Civil Engineering. If it proves successful, similar programs will be introduced at other engineering schools in 1957. Five scholarships have been set up by Socony Mobil Oil Co., an institute member, and a survey of asphalt laboratory facilities in engineering colleges has been completed, and ways are being sought to remedy deficiencies. To spur postgraduate study, the Bernard E. Gray Fellowship has been established at the University of Maryland. The first award winner is expected to begin study this year. Two additional full fellowships have been offered by the Shell Oil Co. and the Esso Standard Oil Co., both institute members, but the schools have not yet been designated.

Steel structures

A 28-page illustrated catalog on standardized steel structures for building construction has been issued by the designer and producer, Luria Engineering Co. Data on the firm's "F" buildings (flat-roof structures), "A" series (spans of 100 feet and over), "B" series (center-column buildings), and "C" series (clear spans with crane runways), as well as on standardized hangars and other airfield facilities, is given.

To obtain this catalog write to Luria Engineering Co., 511 Fifth Ave., New York 17, N. Y., or use the Request Card at page 18. Circle No. 45.

It is reported that inadequate roads have cost the motoring public about \$5.3 billion in accidents, loss of time, and operating costs.

For more facts, circle No. 216

TEST RESULTS

No. 470 Lowbowl Scraper (18 cu. yd. struck capacity) vs Competition

No. 470

AVERAGE LOAD

18.1

BANK CU. YD.

Scraper A

18 cu. yd. struck capacity

AVERAGE LOAD

14.8

BANK CU. YD.

No. 470

AVERAGE LOAD

18.1

BANK CU. YD.

Scraper B

Sideboarded — 18 cu. yd. struck capacity

14.3

BANK CU. YD.

LOWBOWL ADVANTAGE:

3.3 bank cu. yd. per load

Test conditions: Damp silty clay—density: 3300 pounds/cu. yd. Weight comparisons: Average net load, pounds: No. 470—56,225; Scraper A—48,675.

Comments: On one load, the operator of Scraper A was asked to pick up a load which weighed 58,875 net pounds—less than the average load carried by the No. 470!

LOWBOWL ADVANTAGE:

3.8 bank cu. yd. per load

Test conditions: Sandy clay. Density: 3100 pounds/cu. yd. Weight comparisons: Average net load, pounds: No. 470—56,225; Scraper B—44,400.

Comments: Average loading time for both machines was comparable. In total cycle time, the DW21 had the advantage. Its transmission provided a better match to rimpull requirements, and its shorter turns saved time on the fill.

No. 470

AVERAGE LOAD

18.1

BANK CU. YD.

Scraper C

18 cu. yd. struck capacity

AVERAGE LOAD

14.3

BANK CU. YD.

No. 470

AVERAGE LOAD

15.6

BANK CU. YD.

Scraper D

Sideboarded — 18 cu. yd. struck capacity

13.3

BANK CU. YD.

LOWBOWL ADVANTAGE:

3.8 bank cu. yd. per load

Test conditions: Damp silty clay. Density: 3300 pounds/cu. yd. Weight comparisons: Average net load, pounds: No. 470—56,225; Scraper C—47,290.

Comments: Scraper C, like Scraper A and the No. 470, has a capacity of 18 cu. yd. struck. On the job, where results, rated capacities, are the true yardstick of a machine's ability, the No. 470 Scraper with Lowbowl design decisively led the other two.

LOWBOWL ADVANTAGE:

2.3 bank cu. yd. per load

Test conditions: Heavy clay. Swell about 40%. Density: 3440 pounds/cu. yd. Weight comparisons: Average net load, pounds: No. 470—53,550; Scraper D—45,630.

Comments: In the tests, Scraper D scored next best to the No. 470. Scraper D is the "old" DW21-No. 21, a unit that set records for high production at low cost the world over. Now, in the new DW21-No. 470, Caterpillar has produced a unit that's even better—and way ahead of competition!

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BIGGER, FASTER LOADS
WITH LOWBOWL SCRAPERS

Results on the job, not rated capacities, are the only true measure of a machine's ability to produce. Check the results here and judge for yourself how much the extra capacity moved by the DW21-No. 470 Lowbowl Scraper can profit-wise to you!

Your Caterpillar Dealer has a complete report of this job test on the Kansas Turnpike—as well as similar reports from other sections of the country. Ask him to show you the advantages of Lowbowl Scrapers on your job.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



Wet soil, excavated for a sewer trench by a Lima Paymaster with a Yaun 1-yard dragline bucket, is cast to a stockpile where it can be aerated and dried before being backfilled.
C&E Staff Photos



Select material, covering the pipe for a 1-foot depth, is compacted in the trench by Triplex air tampers supplied with air by 600-cfm compressors. The extra handle on this tamper was improvised on the job.



This shop-made 4,000-pound drop hammer, working in a set of leads on a Mack truck, breaks up old wire-reinforced concrete. A Novo hoist operated by a Hercules engine raises the hammer.

Wet material, old concrete handled efficiently on air base project

Concrete broken by shop-made hammer is hauled away free; earth is excavated, aerated, then replaced for subgrade

The slogan "It pays to advertise" really has a place in construction operations, as project manager J. C. Mathes of Airport Constructors proved when it came to moving 40,000 square yards of old broken concrete pavement during work at Lake Charles Air Force Base, Lake Charles, La.

Hauling this amount of material to a waste area in trucks rented at \$4.50 per hour would have put a big dent in profits for Airport Constructors, a joint venture of two Louisiana firms—T. L. James & Co., Inc., Ruston, and W. R. Aldrich & Co., Baton Rouge. Mathes, to avoid the big outlay and to find out if advertising would pay off, inserted this ad in a local paper:

Free
Broken Concrete
We will load your trucks
Daily
Starting at 7:00 a. m.

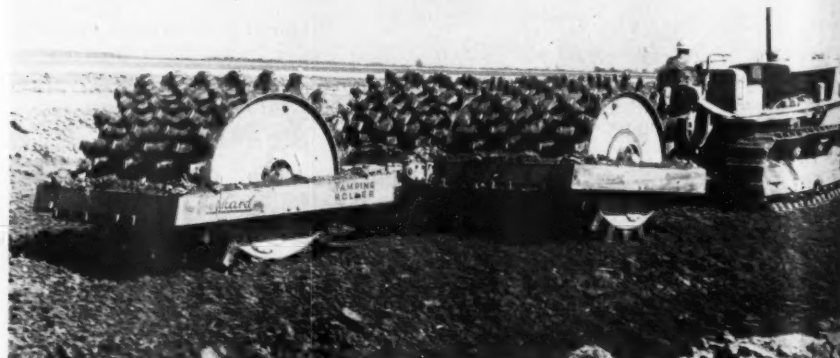
The next morning, a fleet of dump trucks was on hand to haul the material away as fast as a shovel could load it into the dump bodies. The trucks were on hand, day after day, until the old slab had been entirely broken up and removed. The ad paid off in more ways than one. Not only did the joint-venture save the cost of trucking the material away, it avoided the trouble and expense of locating a waste area and made some friends among local people who needed the material for their own use.

This handling of broken concrete was, of course, only a small part of the \$3,514,896 contract for the extension of the taxiways and apron at the base. The joint venture did the 157,000-cubic-yard paving job, while earthwork and drainage were done by W. R. Aldrich & Co. The work was planned and supervised by the

Unsuitable subgrade material is excavated by an Allis-Chalmers Model 200 scraper, pushed in loading by an A-C HD-20 tractor. Organic silt was wasted, but most of the other material was stockpiled, aerated, and re-used.

This double Rome disk, pulled by a Cat D8, proves one of the most useful machines on this job. The disk takes a deep cut, turning material over so that excess moisture can evaporate.

Material aerated until it is near optimum moisture content is replaced in the excavation and given an initial compaction by Gebhard sheepfoot rollers pulled by a Caterpillar D8 tractor.



Galveston District of the U. S. Army Corps of Engineers.

Soil is aerated

Water from the sky and water from the ground combined to hamper the start of operations at the base. Although the ground in the area is an average of about 17 feet above mean Gulf, the ground water is very close to the surface. Its level also fluctuates, rising as much as 3 or 4 feet with a high tide. As is true in most of the Louisiana coastal area, there is little granular material, and the alluvial soils have low stability. An unusual amount of effort was required to stabilize the soil sufficiently to provide a satisfactory subgrade for the new concrete pavement.

Using four Allis-Chalmers Model 200 scrapers and two of the new Model 360 machines, the contractor excavated down to clay, going an average depth of about 2½ feet below the bottom of the slab. Most of this excavated material was an organic silt that had to be wasted. Some of the best material and some of the wet clay under it was taken out and stockpiled to reduce the moisture content. Scrapers brought this usable material up into long, low stockpiles to provide for maximum aeration as well as for the drainage of moisture by gravity.

A Caterpillar D8 tractor pulling a Rome disk worked the surface of the stockpiles, turning the soil over to help the aeration. The big Rome disk was very effective in this drying operation. As the soil neared optimum moisture content, it was picked up from the stockpiles and replaced in the excavation by the scrapers, then compacted by Caterpillar D8 tractors pulling triple Gebhard sheepsfoot rollers. Final compaction was done by Grace 13-wheel oscillating-wheel rollers pulled by Farmall rubber-tire tractors.

When the material had been compacted to a density of at least 90 per cent Modified Proctor, a high amount of shrinkage was noticeable. Additional material, to compensate for the shrinkage and to replace the unsuitable material which had been wasted, was secured from borrow pits on the base within a haul of about a half mile. This dirt was loaded and hauled by Allis-Chalmers scrapers, which were given a push-loading assist by Allis-Chalmers HD-20 tractors. Caterpillar and Allis-Chalmers tractor-dozers spread the fills. Final finishing of the subgrade and maintenance of the haul roads was handled by three Caterpillar No. 12 motor graders.

Break up old concrete

Approximately 40,000 square yards of old 6 and 8-inch concrete pavement reinforced with wire mesh was broken up with the aid of a shop-made machine. This rig had a 4,000-pound drop hammer mounted in a short set of leads that was attached to the rear of a Mack truck chassis. The hammer, raised in the leads by a Novo hoist operated by a Hercules engine, was dropped by gravity. As the

hoist operator raised and dropped the hammer, the truck driver moved the rig slowly ahead, so that it did a fast and satisfactory job of breaking the old concrete. Broken concrete was loaded into the volunteer trucks by a Northwest 1½-yard crane and was hauled off the base.

Before the grading could be completed, it was necessary to install more than 3,000 linear feet of reinforced-concrete-pipe storm drains in sizes ranging from 30 to 54 inches. A Lima Paymaster dragline using a Yaun 1-yard bucket and a Northwest Model 6 dragline using a Blaw-Knox 1½-yard bucket excavated the trench for the pipe and lowered the pipe into place. Select material, placed around

the pipe, was built up 1 foot above the pipe. This material and the remainder of the backfill was carefully compacted with air tampers. Single tampers were used to place the material in restricted spaces around the pipe, but in the rest of the trench, three Triplex air tampers did a fast and thorough job. Ingersoll-Rand and Gardner-Denver 600-cfm compressors supplied the air.

Although the start of the project was delayed about a month, the contractor made up time as soon as the weather cleared. Excavation actually started about January 1, 1955, and paving got under way about May 1. The 17-inch concrete slab of the apron and taxiway, measuring 1,075 × 2,654 feet, was

laid in strips 25 feet wide. By August, after crews had worked 9 and 10-hour days, six days a week, the 157,000-cubic-yard concrete paving job was completed.

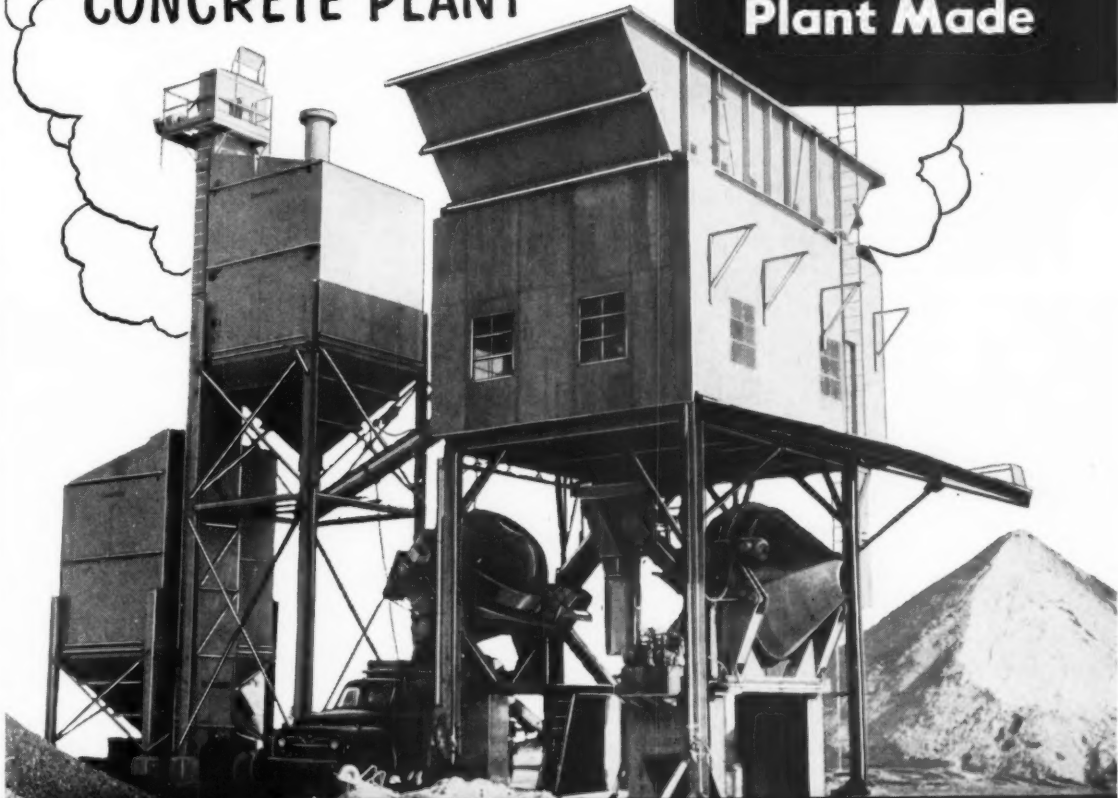
Personnel

The project manager for the joint venture was J. C. Mathes. He was assisted by project engineer W. A. Patrick and superintendent E. T. Underhill. The U. S. Army Corps of Engineers had Stacy McKnight as project engineer and Robert A. Middleton in charge of the very delicate job of soils engineering. The district engineer for the Galveston District of the Corps is Col. W. P. McCrone.

THE END

AMAZING NEW Burmeister CONCRETE PLANT

Does More Jobs
Than Any
Plant Made



DESIGNED and BUILT by **Burmeister** for GEO. M. BREWSTER & SON, INC.

Extremely versatile . . . easily portable . . . quality controlled batching automatically . . . that's the performance GEO. M. BREWSTER & SON, INC., Bogota, N. J., gets with this BURMEISTER-built plant! This BURMEISTER engineering masterpiece can do more individual jobs than any other plant on the market today . . . can produce up to 380 cu. yd./hr! Low plant height holds your costs to a minimum . . . only 42' high with two 4-yd. mixers. Plant is shown equipped with 300-ton, 3-aggregate compartment bin. Bin can be made in any size. Bin is pinned, not bolted together for quick portability. Engineered with twin 4-yd. BURMEISTER Tilt-Up mixers, this plant is available with 1, 2, 3, 4, 5, 6 cu.-yd. or larger mixers. Big BURMEISTER mixer blades deliver batches in record time. Plant is complete . . . all starters mounted in cabinet . . . all plug-in connections on air cylinders . . . solenoid operated gates for batching. Includes slump meters, moisture compensator, over-and-under interlocks, presets, counters, timers and recorders . . . everything in one package! For further details see your Dealer or write L. BURMEISTER COMPANY, 4545 W. Mitchell St., Milwaukee, Wis.

**VERSATILE • PORTABLE •
QUALITY CONTROL • BIG
CAPACITY • AUTOMATIC
OPERATION**

- CENTRAL MIX PAVING
- CENTRAL MIX STRUCTURES
- DRY BATCH PAVING
- TRANSIT MIX OPERATIONS
- MASS POURS
- PROJECT POURS
- CAPACITY DESIGNED TO
HANDLE UP TO
380 CU. YD./HR.

WRITE FOR FULL DETAILS

Write or call for complete information. We will be happy to answer your questions . . . without obligation.



Burmeister

COMPLETE PLANTS FROM A SINGLE SOURCE

For more facts, use Reader-Reply Card opposite page 18 and circle No. 217

Hauls held to a minimum on bituminous expressway

Texas contractor's fixed-base operations supply materials for curb and gutter, rock base, and paving



Sand for concrete and bituminous mixes is dredged from the Colorado River by a Lorain Model 79 crane with Hendrix 2-yard dragline bucket and loaded into a Koehring Dumptor.

IMAGINE

NO CENTER PIN OR NUT

NO TURNTABLE ROLLERS

NO ADJUSTMENTS

WITH LORAIN'S NEW REVOLUTIONARY

"SHEAR-BALL MOUNTING"

THE GREATEST SHOVEL-CRANE DEVELOPMENT IN YEARS

With this revolutionary type of shovel-crane mounting, the Turntable revolves on a full circle of over 60 hardened steel balls snugly sealed in hardened steel races. In this design, the outer race is attached to the mounting, the inner race is attached to the Turntable . . . and the design is such that the balls themselves interlock the two races and thus hold the Turntable on the mounting. As a result, the balls take all vertical, horizontal and radial loads and thrusts; consequently, there is no need for a center pin and center pin nut, no need for a centering gudgeon and bushing, no need for Turntable top rollers or hook rollers, no need for an exposed roller path. And, thus, all the constant adjustments and other nuisances of these items are also banished forever for shovel-crane users.

At present, this new development in shovel-crane mountings is standard on 30-ton rubber-tire Lorains; is available as optional equipment on (1) 20- and 25-ton crawler machines and (2) 25-ton rubber-tire Lorains, in which case it permits greater lifting capacities when working on outriggers. Be sure to get all of the money-making facts about the new "Shear Ball Mounting" from your Thew-Lorain Distributor!

THE THEW SHOVEL CO., LORAIN, OHIO, U.S.A.



THEW
LORAIN®

For more facts, use Reader-Reply Card opposite page 18 and circle No. 218

Paving on a 3-mile section of the expressway carrying U. S. 81 through Austin, Texas, has opened another segment of this beautiful superhighway, which, since the start of construction in 1950, has extended from the north through most of the residential and business districts of the Texas capital.

When completed, the new highway will permit traffic to go through the metropolitan area on separated roadways having no grade crossings. In keeping with the policy of the Texas State Highway Department, frontage roads are being constructed along both sides to serve abutting property. Numerous interchanges make it convenient for city traffic to get on and off the expressway.

The newest portion of the road extends from the south end of the recently completed bridge across the Colorado River, running through the hilly suburban district at the south edge of the city. Contracts for the base, bituminous paving, and curbs and gutters were awarded to general contractor McKown & Sons, Austin, for the McKown interests include Capital Construction Co., Capital Ready Mix Concrete Co., and Austin Sand & Gravel Co. These have fixed base facilities for producing crushed rock, sand and gravel, ready-mixed concrete, and hot bituminous mixes—all within a few miles of the job site.

One of McKown's contracts included grading, structures, base, and pavement on a 1.012-mile section at a contract price of \$681,000. The firm also placed the bituminous surfacing on an adjacent stretch of road under contract. Including work completed last summer, the McKown firm has completed contracts totaling about \$2 3/4 million on this expressway.

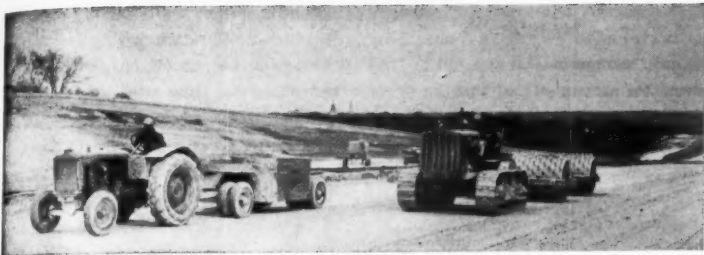
Quarry produces base rock

A subcontractor did the grading, moving most of the dirt with three Caterpillar DW15 scrapers. The subgrade was finished to a tolerance of 0.1 foot, watered, bladed, and rolled with sheepsfoot and pneumatic rollers to a density of at least 95 per cent in the top 6 inches.

Crushed limestone base material was produced in a quarry that also produces coarse aggregates for concrete and bituminous mixes. Drilling is done in the quarry by a pair of Caterpillar D7 tractors specially equipped as one-man drill rigs. On the rear of each tractor is a Gardner-Denver 315-cfm air compressor driven by the tractor engine. An A-frame on the front of each tractor supports the leg of a Gardner-Denver wagon drill through a universal joint mounting. This makes the drill hang vertically from the A-frame, regardless of the position of the tractor.

At the lower end of the drill leg, an air ram with a moil point is attached to the back of the leg. When the drill is in position, the operator actuates the air ram, which sticks the moil point into the rock and holds

CONTRACTORS AND ENGINEERS



After being watered, the base material is compacted by several methods. The Allis-Chalmers tractor, left, pulls an Ingram 10-wheel pneumatic roller, and a Caterpillar D7 tractor pulls Tampo and Ingram sheepsfoot rollers.



A Chevrolet truck fills the hopper of the Adnun (Blaw-Knox) paver during work on the surface course. On the side of the paver is a shoe that delivers just the right amount of material to the joint for a smooth and tight seam.

the drill leg in position while the hole is being drilled. One-piece Timken steels and Timken fishtail bits are used to drill the blast holes. One operator moves the tractor, spots the drill, drills the hole, and raises the drill for the next move, leaving the tractor only to change bits.

Secondary breaking by a Bucyrus-Erie 10-B crane and a shop-made 2,500-pound breaker ball is sometimes done so that pieces can be handled at the crusher. Rock is loaded by a Northwest Model 6 shovel and hauled to the crusher by three or four Koehring Dumpsters. The rock is fed on a 30-inch plate feeder to a Universal impact crusher, which reduces it all to minus-2½-inch size for the base material. This electric-powered crusher produces 200 to 215 cubic yards of material per hour on the average, and sometimes it turns out as much as 280 yards per hour.

Crushed rock was hauled to the roadway by trucks that dumped the material in piles in a row. When these piles had been formed in a windrow, the material was spread over the roadway in uniform layers by Caterpillar No. 12 motor graders. On the main roadways the base is 18 inches thick and is laid in four approximately equal compacted courses. Frontage roads have 15 inches of base laid in two 6-inch and one 3-inch courses.

Each course was thoroughly watered and compacted with Tampo and Ingram sheepsfoot rollers pulled by a Caterpillar D7 tractor and Tampo and Ingram pneumatic rollers, pulled by Allis-Chalmers tractors. The surface was finished with an Ingram 10-ton 3-wheel roller. The same equipment and methods were used on both the main expressway lanes and on the frontage roads.

The finished base was primed with MC-1 cutback asphalt, at the rate of 0.2 gallon per square yard, applied by an Etnyre 1,800-gallon distributor mounted on an Acme tandem trailer pulled by an International truck. This prime was permitted to cure three or more days before the tack coat of RC-2 cutback asphalt was applied and surfacing done.

Stationary hot-mix plant

The Type C hot-mix surfacing material was a dense graded mix with maximum ¾-inch aggregate. The mix contained coarse and intermediate gravel, limestone dust, fine sand, and 4.1 to 4.5 per cent of 90 to 100-penetration asphalt cement. Sand and gravel were obtained from the Colo-

rado River bed in an operation conducted by the Austin Sand & Gravel Co.

Material dredged from the river by a Lorain Model 79 dragline with a

(Continued on next page)

**200 to 400
TONS PER HOUR!**

when it gives
Production like this—

IT'S A CEDARAPIDS COMMANDER

Wherever you see a portable aggregate plant producing 200, 300 or 400 tons per hour, day after day and month after month, with low, low operating costs — chances are it's a Cedarapids Commander!

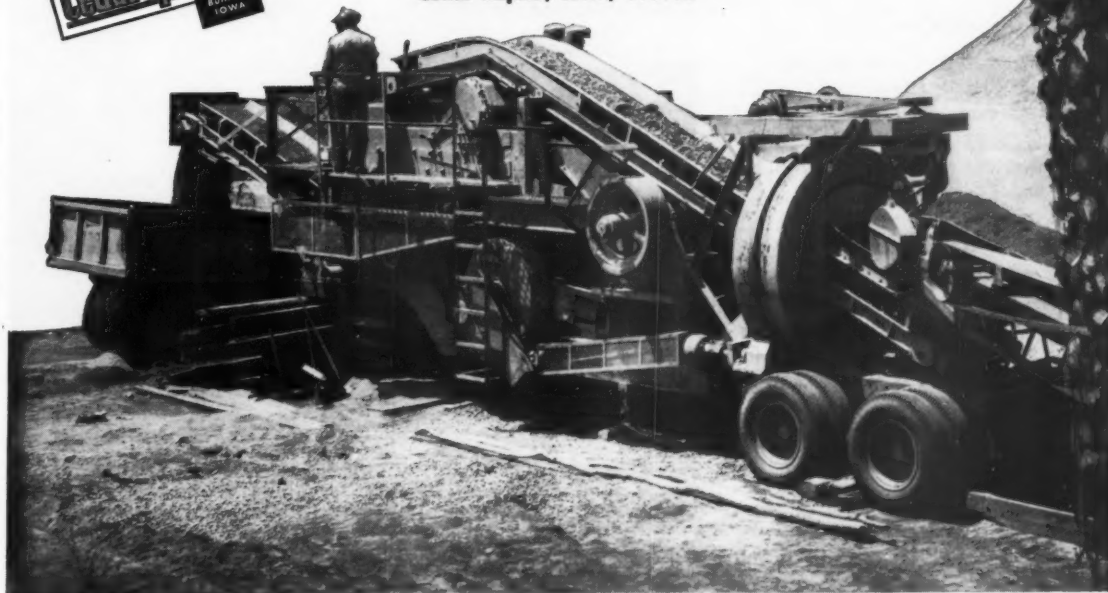
The plant shown below, owned by P. O. Pederson of North Branch, Minnesota, is turning pit run gravel (with crushing 15% and up) into ¾" and 1" aggregate at a rate of 200 to 300 tons per hour. Other producers report as high as 400 tons per hour production!

The big, balanced production of crushers, horizontal screen and conveyors is the secret of the Commander's high tonnage output. Cedarapids-Quality construction is the secret of low maintenance and operating costs.

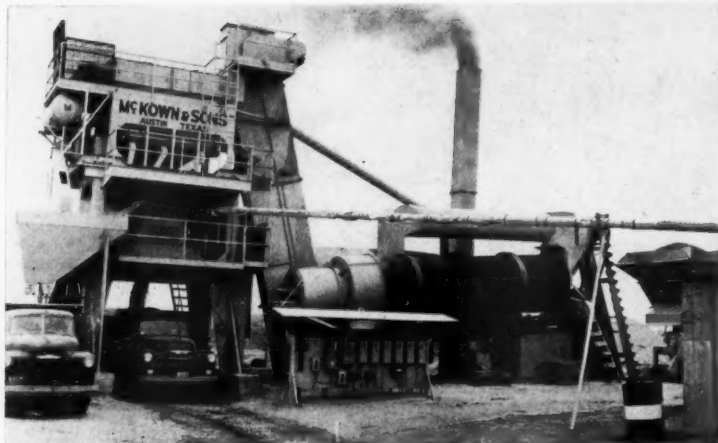
There's sure to be a Commander working near you. Watch it produce — ask the owner for his opinion — then call your Cedarapids distributor for additional information.



IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 219



Set on concrete footings at the company's yard in Austin, this Madsen 3,000-pound batch plant produced hot-mix for the job. All electric in operation, and gas-fired, the plant has a dryer 72 inches in diameter and 28 feet long.

C&E Staff Photos

Hendrix 2-yard bucket was loaded into three Koehring 6-yard Dumpsters that hauled it to the crushing and washing plant. A Pioneer reciprocating feeder and conveyor carried the raw materials to a Universal 24x30 jaw crusher. All the material passed through this crusher and was conveyed to a Symons 4x12-foot triple-deck vibrating screen mounted on top of a pair of Pioneer steel bins.

Properly sized sand and gravel passed from the screens directly into the bins. Oversize was fed to a 2240 Pioneer roll crusher arranged in closed circuit with the screens. Finished materials were trucked to stockpiles by a pair of Chevrolet dump trucks. Sand and gravel were recovered from the stockpiles by a Scoopmobile Model LD-10—a four-wheel drive machine with 1½-yard bucket, —three Trojans, one Pettibone-Muliken, and one Lorain TL-20 clamshell.

On a site near the gravel setup, McKown has a Madsen hot-mix plant on concrete footings as a stationary plant. The plant has a 72 inch x 28-foot dryer fired with natural gas, and a 3,000-pound batch pugmill. A Lorain TL-20 crane with Owen ¾-yard clamshell bucket feeds the aggregates to the Madsen four-compartment bin. Reciprocating feeders deliver proportioned volumes from each compartment to a belt feeding the boot of the cold elevator.

Hot-oil heater

Asphalt cement is stored in three tanks, a 10,000-gallon tank and two underground tanks with a total capacity of 32,000 gallons. Heat for these storage tanks, the jacket of the mixer, and the asphalt-handling equipment is supplied by a HiWay Model 50B hot-oil heater. This completely automatic unit, housed in a small building near the plant, burns natural gas and requires only an occasional check to insure continuous operation.

Surfacing material produced by this plant was hauled to the road in a fleet of Chevrolet dump trucks and dumped into the hopper of an Adnun finishing machine. Three inches of surfacing was laid on the main roadways in two courses. Frontage roads received a single 2-inch mat. A shop-

made boot was attached to the finishing machine to deliver just the right amount of material at the joint. This reduced the amount of hand raking that would have been required while giving the road a joint so smooth and tight that it was difficult to see after it had been rolled. Compaction of the surfacing was done by a Tampo 10-ton tandem roller and an Ingram 10-ton three-wheel roller.

Miscellaneous equipment with the road crew on the blacktop operation included a Grace broom pulled by an Allis-Chalmers tractor. This was used to get foreign material off the road ahead of the surfacing operation. An Athey loader, used in the cleanup operation, loaded excess dirt from the shoulder to trucks.

Curbs and gutters were constructed

on both sides of all roadways in this section of the expressway by Capital Construction Co. Excavation for the curb and gutter was done with an Allis-Chalmers Model D motor grader. Forms were set by hand, and concrete was poured either from ready-mix trucks or from Getman Scoot-Crete power buggies hauling from a Muller Mixer.

Personnel

The several phases of the operations were supervised by members of the McKown family. O. B. McKown, general manager of McKown & Sons supervised the over-all activities while O. B. McKown, Jr., owner of Capital Construction Co., supervised construction of curb and gutter and other concrete work. A. S. McKown is gen-

ROADBUILDERS!

HOW TO

New SEAMAN-ANDWALL TRAV-L-PLANT COMPLETES 22-FOOT BITUMINOUS ROAD BASE AT MILE-A-DAY RATE

New speed in road building is announced by the Seaman-Andwall Corporation, which now offers a complete line of equipment for stabilized road construction. Roadbuilders who have been interviewed state that Seaman-Andwall Sta-Bilt equipment provides better, more durable bituminous roads at lower cost with greater strength, higher densities — built at a mile-a-day production rate.

Much of the credit for this road building speed-up is given to new versatility built into the Seaman Trav-L-Plant, a double-duty and often triple-duty machine that performs "in-place" mixing and binder application together with light scarification in one time-saving simultaneous operation.

Not only is the TRAV-L-PLANT used for new bituminous road construction, but it is widely accepted as fast, economical equipment in reconstruction of old, worn out bituminous roads. In such work the TRAV-L-PLANT as it mixes, quickly reduces the previously scarified material to original aggregate size ready for compaction.

The basic operation of the Seaman equipment is that of soil stabilization — the "in-place" mixing, blending and assembly of the base materials. It thoroughly mixes the fines and coarse materials so that voids are filled, and larger aggregates are interlocked and securely mortared-in by the fines. The mix compacts to higher, much higher, densities

for greater load bearing value. The TRAV-L-PLANT no longer wears and much lower surface maintenance.

The TRAV-L-PLANT pumps binder into the mix from a transverse port truck operating at the side of the road or ahead. Full tachometer assembly, gauges and volumetric meter properly provide precision application through a spray bar positioned in the mixing chamber. Binder is applied directly into the mix. Because there is no time delay between base stabilization and binder application and mixing, the bitumen has no time to cool before it's in the mix. Run-off migration is also entirely prevented.

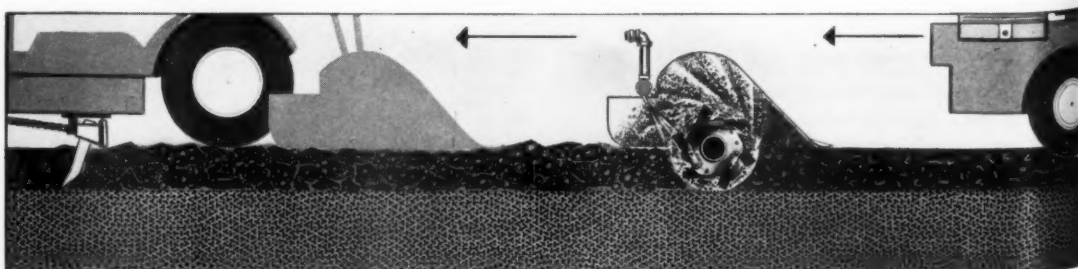


Above — Seaman Self-Propelled TRAV-L-PLANT in bituminous parkway construction, Jacksonville, Fla. Binder is pumped from transverse port ahead of the Seaman.



Sta-Bilt Method of Road Stabilization

The Seaman-Andwall TRAV-L-PLANT scarifies old bituminous material; the rotor reduces the lumps to original aggregate size and, simultaneously, new binder is applied through spray bar mounted just ahead of the rotor. Compaction follows immediately after the TRAV-L-PLANT has completed its operation.





Material going into the primary surge hopper of the plant is carried by reciprocating feeder and conveyor to a Universal 24 x 30 jaw crusher. It then goes to a Symons triple-deck screen above the Pioneer bins, while oversize goes to a roll crusher.

eral superintendent of construction, directly supervising the activities on the road. Storm sewers and concrete construction on the project were supervised by B. A. McKown.

Superintendent of the road construction operations was Bryan Butler. The asphalt plant was handled by J. P. Edminston. The paving mix superintendent was Ted Myatt. The superintendent of the crushed limestone plant is J. P. Spiney. General manager of the Austin Sand & Gravel Co. was A. L. McKown. Plant superintendent of the Austin Sand & Gravel Co. was Louis Green.

In supervising and correlating the many operations, the McKowns made good use of their Motorola short-wave radio system. The company has 32 stationary and portable Motorola

units in offices, plants, automobiles, and pickups.

The Austin expressway system is being constructed by the Texas Highway Department, of which D. C. Greer is state highway engineer. This work is in District 14, which has Ed Bluestein as district engineer. Expressway engineer for the district is Travis Long. Resident engineers on the construction were Robert Keyser, Maurice H. Clark, and Davis McKee.

THE END

Site conditions determine best method of lining old drainage structures

The technique of lining structures with such material as corrugated metal rather than replacing them entirely, is giving highway departments a way to get a lot of work done for a relatively small part of the maintenance dollar.

How economically such a job can be done, however, depends on the careful consideration of such things as how much the existing opening can be reduced, the additional strength needed in the lining, existing foundation conditions, and space available at the site.

If the exact cross section of the existing opening at all limiting points is known, along with the alignment of the structure with respect to its center line, foundation conditions, and any projections that might interfere with the lining, it will be possible to determine the permissible reduction in the opening and, in turn, how tightly the lining material will have to fit the existing structure. Strength requirements will be determined by whether or not the existing structure requires only strengthening or a full load-carrying replacement. And the space available adjacent to the structure or within it will determine whether the lining material must be designed to be erected in place or whether it can be assembled outside and pulled into place.

Since an arch-type lining requires an adequate foundation, a new one may be necessary. Pipe and pipe-arch shapes are self-supporting, however, and may overcome inadequate foundations if the stream bed is stable.

If space is available, the lining can be assembled outside the old culvert and skidded into place. Otherwise, it will be necessary to use a tunnel-liner type of material that allows assembly to be done from inside the structure.

The best type of backfill to use depends on the type of structure, the area to be filled, and the equipment available. Sand is best if the area to be filled is large or if the old structure is weak. A masonry wall closure at both ends is usually provided to hold the material in place.

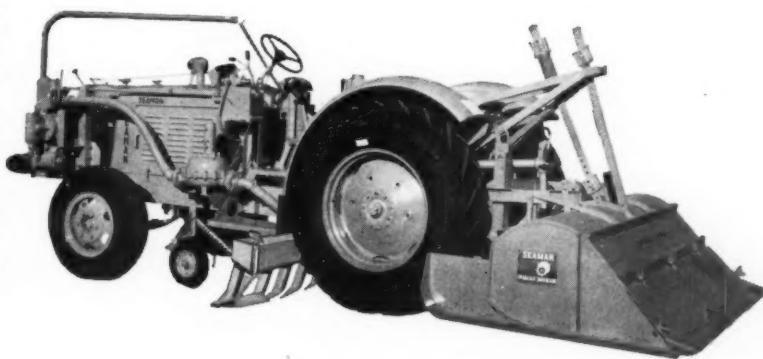
A weak sand-cement grout may be used for small openings, and a rich grout for small areas where it is desirable to strengthen or seal the existing masonry structure. Concrete is rarely used. Most of the time it is used if the lining serves essentially as a form and the concrete becomes the load-carrying medium.

WHO BEAT THE CLOCK...

g value the TRAV-L-PLANT leaves the a lower surface partially compacted, ready for final rolling, an operation further improved by the new a transman-Andwall compactor. the side these rollers offered in steel r assembly and pneumatic models ter properly power to the front rolls. through this produces a "straight down" in the pressure which eliminates shov- is aging, shearing, scuffing and tear- ix. Being of the surface which is so elay beaten the case with rear drive on and rollers. By this principle the task mixing compaction is correctly ac- to accomplished in much less time, and n-off with fewer trips to attain speci- ly pressed density.

SEAMAN TRAV-L-PLANT

Today's most versatile road-building machine. Equipped with pump tachometer assemblies, volumetric meter, spray bar to apply bitumen or water simultaneously with mixing-in-place operations. Also available with new UNDERBODY SCARIFIER — for extra versatility.

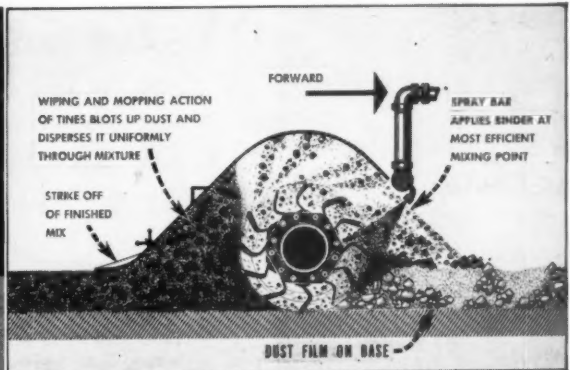


NEW S-A UNDERBODY SCARIFIER

ounted between rear and front wheels of the TRAV-L-PLANT, this unique new Scarifier Attachment can often be used for light scarification and frequently in the same operation with mixing and binder application, depending on conditions. Easily attached, it adds one more operation to the TRAV-L-PLANT efficiency.

S-A SPRAY BAR AND MIXING CHAMBER

Illustration shows location of spray bar just ahead of tines on TRAV-L-PLANT. Binder is instantly mixed without any opportunity for run-off or migration. Notice blending of fines and coarse with aggregates interlocked to correct segregation.



Stabilizing the World



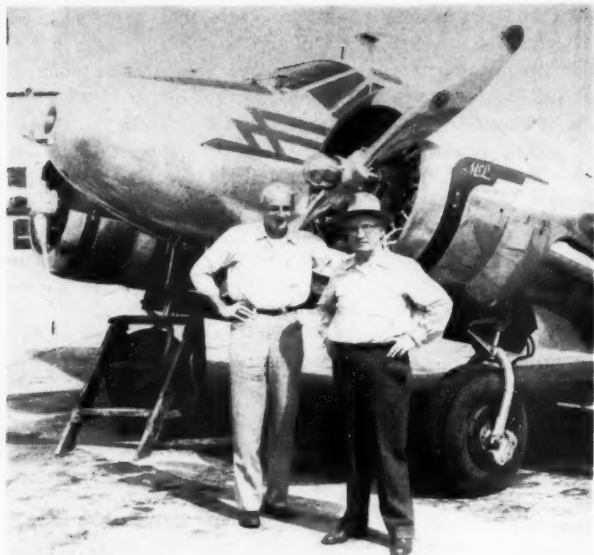
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SEAMAN METHOD OF BITU-
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 220



Left to right, Harris Van Sickle, a World War II Air Transport Command pilot, and J. L. McLaughlin, president of McLaughlin, Inc., get ready to board the company plane.

management

Do company planes pay off?

A Montana construction firm answers "yes" after eight years of using its private plane

Construction firm officials trying to decide whether or not a company plane will pay off, and justify its initial cost and upkeep, might get some help in making up their minds by taking a look at the operations of McLaughlin, Inc., Great Falls, Mont.

At the height of work last season, one of McLaughlin's executives accomplished the seemingly impossible, personally handling important matters for the company in Salt Lake City, Utah, and Edmonton, Alberta, in the same day. Leaving Great Falls in the morning in the company's Beechcraft 18-S plane, he wrapped up business in Salt Lake City, then took off for Edmonton. By dinner time the same evening, he was back in Great Falls.

Episodes like this are hardly the exception for McLaughlin, Inc. The 900-hp Beechcraft, having an average speed of 200 mph, is the company's third plane. Last year, it was in its hangar in Great Falls Municipal Airport only 133 nights. The plane is in the air an average of about 60 hours per month, or about 700 hours per year. To McLaughlin's officials, the Beechcraft has become another necessary piece of equipment for their business and is regarded much the same as a dragline, tractor, calculating machine, or automobile.

The reasons for this attitude are easy to understand. McLaughlin's headquarters office in Great Falls is in the center of one of the biggest and loneliest states in the country. A man can drive across Montana from dawn to dark without getting out of the state.

With the Beechcraft, distances have become relatively unimportant for the firm. The flying time from Great Falls to Salt Lake City is 2 hours 30 minutes. San Francisco to Kalispell, Mont., takes 4 hours 10 minutes. An automobile trip via twisting mountain roads from Kalispell to Great Falls takes the greater part of a day; by plane the trip takes 50 minutes.

J. L. McLaughlin and O. W. McIntyre of McLaughlin, Inc., agree wholeheartedly that the plane has proved invaluable in getting executives to trouble spots quickly so that unexpected problems can be straightened out. But according to McIntyre, one of the biggest advantages of company ownership of a plane is that it makes possible the bidding of many jobs that the firm might not handle otherwise. Flying to places where jobs are up for bid, McLaughlin, McIntyre or the general superintendents can make personal inspections of the site before submitting a bid.

Making bids, taking care of job

SPECIALIZED LANDCLEARING EQUIPMENT



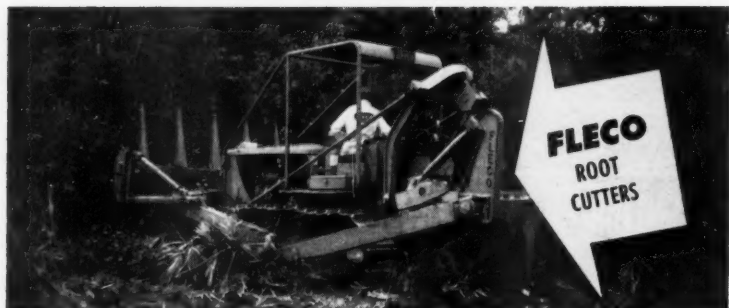
To Clear and Stack Trees, Rocks, Brush



To Cut Off Trees Flush With Ground



To Remove Stumps Faster



To Cut Trees, Brush Below Bud Ring

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SILENT HOIST KRANE KAR

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SAVES US ONE MAN,"**
says Jim Gull, Supt. Equip't.,
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New Lincoln Tunnel
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— FLUID DRIVE!

"We had a 20-ton crane on the job; now the KRANE KAR* does it faster and saves us one man. Works all over site as utility crane, 8 hrs. a day, 5 or 6 days a week. Handles beams, buckets, concrete and steel forms, lumber, cement, etc. Stores incoming materials and delivers them where needed. Loads, unloads trucks, and carries big loads up and down ramp. KRANE KAR is easy to operate; we have a half dozen men here who can run it. Doing a fine job for us," says Mr. Gull.

Write for illustrated Bulletin No. 79

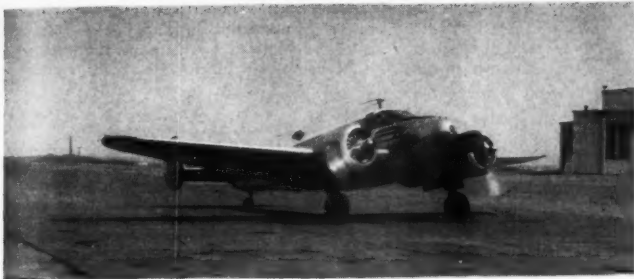
*KRANE KAR Swing-Boom Mobile Crane available gas or diesel; adjustable telescopic boom; rubber tired; 5 sizes: 1½, 2½, 5, 10, 12½ ton cap.

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CONTRACTORS AND ENGINEERS



McLaughlin's Beechcraft 18-S taxis toward gas pumps at the Great Falls Municipal Airport after making the 50-minute flight from Kalispell, Mont. The trip by car takes almost a day's driving through mountain roads.

problems and equipment breakdowns, settling labor disputes, and handling any other pressing problem has been made easier by the Beechcraft. These important matters usually arise without warning, and they need immediate attention. For this reason, McLaughlin and McIntyre cannot afford to rely on scheduled air transportation. Scheduled airlines seldom fly close to active construction jobs, and often reservations are impossible to obtain when trouble occurs at a job site.

All these were some of the reasons the company had for buying its first plane eight years ago. Now, officials can take off, literally on a moment's notice, for a job. There is no waiting for reservations, no waiting for scheduled-airline departures.

Safe travel

According to McIntyre, travel on executive-type aircraft is regarded by insurance companies as being safer than flying on scheduled airlines, chiefly because the private planes are not bound by definite schedules or definite intermediate stops.

McLaughlin, Inc., takes extra as well as ordinary precautions to make all flights safe. Even under the best flying conditions, the plane carries enough gasoline for six hours of flying. It sets down for refueling while it still has enough gas to reach an auxiliary airport or go back to the starting point of the flight.

After every 100 flying hours, the plane flies to Johnson Flying Service, Inc., at Missoula, Mont., where seven highly specialized mechanics make a regular 100-hour check in about two days. Two spare engines for the plane are on hand at Spartan Aircraft Co., Tulsa, Okla., and the plane's motors are changed after every 750 to 1,000 hours of flying. The plane goes to Los Angeles, Calif., for repair work on its radios, the latest type of long-range equipment. Some of its special electronic gear was installed at Teterboro Airport in New Jersey.

Flying considerations

McLaughlin's plane, flying over the entire Pacific Northwest, Canada, and Alaska, often goes into the air for flights over the Rockies at the 8,000 to 10,000-foot range. At the 9,000-foot altitude, its engines deliver about 70 per cent of rated power. But this is not the worst flying, according to Harris Van Sickle, company pilot. The worst is the trip up the Canadian

For more facts, circle No. 223→

coast to Alaska where the air approaches to Valdez, Cordova, and Juneau are notoriously bad.

In McLaughlin's case, the selection of the Beechcraft 18-S—a twin-engine model with two 450-hp engines—gave the company a plane with a maximum flying performance with an optimum outlay of money. Without electronic gear, the plane sold for about \$90,000; fully equipped, it cost a little over \$100,000. But the extra expense, the firm feels, is worth while. Radio and direction-finding equipment comparable to that used by scheduled airliners, an automatic pilot, instrument

landing system gear, and other up-to-date equipment are insuring that all flights are as safe as possible. The cost of a company plane and the cost of upkeep are high, but if anyone should ask McLaughlin executives if company planes pay, their answer would be a resounding "yes!"

THE END

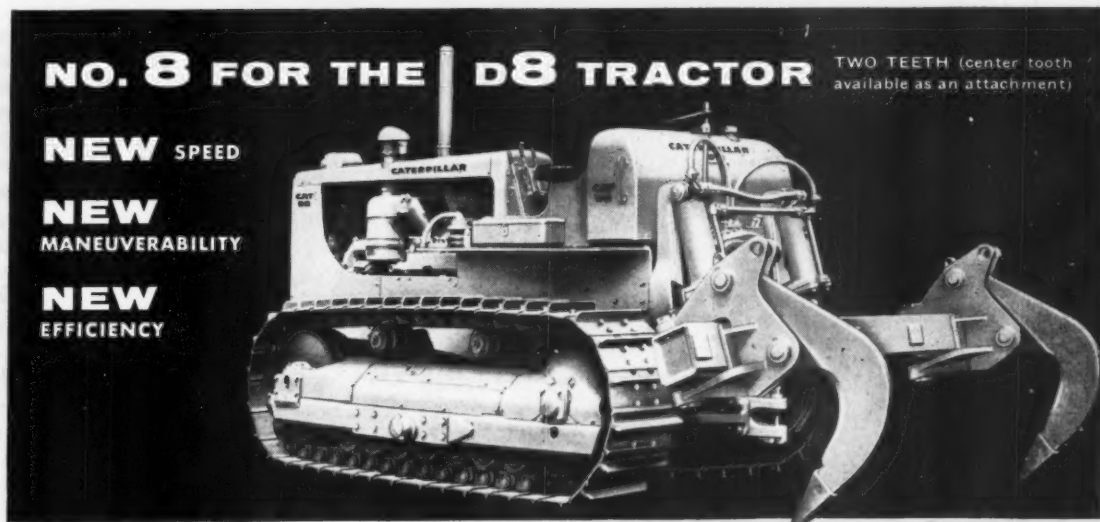
Koehring personnel

The new service manager of the Koehring Co., Milwaukee, Wis., is K. R. Chandler. He succeeds G. N. Nelson who has retired.

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Canal side slopes are dug by this modified Parsons 250 Trenchliner. The shaft at the bottom point of the digging bucket line has been lengthened, and spiral-type knives have been mounted on a cone having an outside dimension matching the slopes.

Special rigs lower costs on small canal-lining job

Modified standard trencher becomes special-purpose excavation rig; slip-form liners are designed to work on large and small sections

Modified standard equipment and special shop-built rigs are increasing job efficiency and lowering unit costs on a \$1,200,000 canal-lining job for the U. S. Bureau of Reclamation in the Columbia Basin—so much so that the contractor recently had the possibility of earning a good estimate in a 30-day period.

The chief rigs being used by Cherf Bros., Inc., and Sandkay Contractors, Inc., both of Ephrata, Wash., are a stock model Parsons 250 Trenchliner, which has been converted into a special-purpose tool, and shop-built slip-form liners for small-size irrigation canals. Both are working well on this job near Mesa, one of the largest in the entire Columbia Basin Project.

Scheduled to be finished April 1, a year from the starting date, are 39 miles of unlined lateral water-distribution canals ranging from 2 to 10 feet in bottom width and having side slopes of $\frac{3}{4}$ to 1, plus 10 miles of con-

crete-lined canal, with bottom widths of 2 to 5 feet, $1\frac{1}{2}$ to 1 side slopes, and a 2-inch-thick concrete lining. A 48-inch concrete pipe siphon, two miles long, and eight miles of concrete pipe laterals, ranging from 15 to 54 inches in diameter, make up the balance of the project, along with small structures such as checks, drops, and cross-overs. All the work is being administered by the Eltopia construction headquarters in the southern part of the job.

Excavation is tough

Credit for working out the mechanical details of the Parsons Trenchliner changeover goes to Tom Barber and Roy Johnson of the contracting organization. Their modification of the machine has made excavation—the worst problem on this job—simpler.

Most of the digging is difficult. Gravelly boulder-studded formations

are common and outcrops of hard, black volcanic basalt rock have to be drilled and shot. Digging is tough even under agricultural soils. But the changeover making the Trenchliner a special-purpose tool for canal excavation allows the canal prism to be formed in soil or light gravel. The machine also works well in sand or large-size gravel.

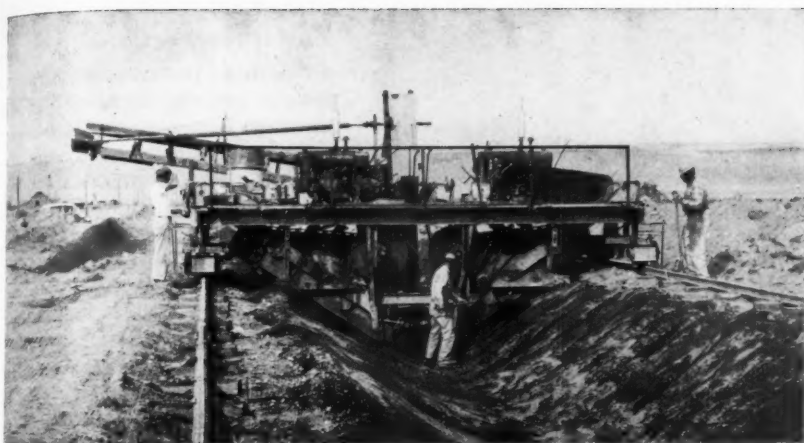
The simple modification consisted of lengthening the shaft at the bottom point of the digging bucket line so that the spiral-type knives could be mounted on a cone having an outside dimension matching the canal slopes. As the bucket line revolves to pick up dirt, the two cone-shaped knives turn, bringing material down the slope and leaving it neatly cut on each side. The outside points of each cone are mounted in heavy duty bearings, supported, in turn, by a built-up steel framework attached to the machine.



A 5-inch-thick course of sand and gravel is deposited in the ditch by a Bucyrus-Erie 22-B crane with a $\frac{3}{4}$ -yard dragline bucket. This material was stockpiled along the berm of the canal.



Compaction of the cushion material is done ahead of the concrete-lining operations by the 22-B, which operates a steel-wheel roller by means of a hoist line and drag cable. The grade is usually left about 1 to 2 inches high for the trimmer.



This shop-built trimmer, powered by a pair of International U2A diesels, levels off the sand and gravel blanket. Only a small amount of material is coming off the conveyor, indicating that the cushion course has been placed to close tolerance.



The smaller of the two slip-form liners, a 3-ton rig, is transferred from a truck to a canal by the 22-B. The liner, used on ditches having a bottom width of less than 4 feet, rides on steel skids instead of rails.

At first, the long wheelbase made it difficult to get the machine around some of the sharp curves of the small canals. But after a time, the operator learned to disregard the string line as the front end of the machine started around a curve. Only the rear or digging end was kept on the string line. This work technique allowed good footage to be made around even the sharper curves. On straight runs, even in gravel, production of about 180 feet per hour is common.

Excavation also included a balancing operation, in which cuts were made and material used to build embankments that were later excavated by machinery. This operation, one of the first work items, required a fleet of five LeTourneau-Westinghouse Model C Tournapulls, an International TD-24 pusher tractor, a D8 dozer, a water truck, and sheepfoot rollers. Since the quantities were balanced, digging was done in one location and the dirt moved to a low spot. The material, spread in lifts from 6 to 8 inches thick, was leveled by a Caterpillar D8 tractor with bulldozer, watered if necessary, and compacted by sheepfoot rollers. Much of the compaction was provided by heavily loaded Tournapulls that rode over all parts of a fill to add to its density.

A large block of primary excavation was done by dragline, particularly in sections where digging was difficult. A Lima 3-yard rig, a Manitowoc 2000 with a 1 3/4-yard bucket, and a Bucyrus-Erie 22-B with 1-yard bucket were all used on this work to good advantage.

They excavated the canal, including the sideslope, either to grade or to solid rock.

Rock formations are drilled by an Ingersoll-Rand 315-cfm air compressor, an Ingersoll-Rand wagon drill, short steel, and I-R Carset drill bits. Holes are spaced from 3 to 6 feet on centers, depending on the depth of the cut, and the solidity of the basalt rock, then loaded with Giant gelatin-type powder. Some over-excavation is necessary in canal cross sections, because plans call for a granular cushion backfill under the concrete lining at these points.

The considerable amount of structure excavation required for this project is being done by a Bucyrus-Erie 22-B crane and a dragline bucket. Two Allis-Chalmers HD-5-mounted front-end loaders are also used on this phase of the work, mainly for backfilling after the small structures have been stripped.

Ballast precedes concrete

Before work is done on the lined sections of the canal, a 5-inch-thick granular cushion course is placed to keep the lining from bearing directly

on rocky points. The sand and gravel course also permits excavation and concrete to meet neat lines.

The cushion course material is a well-graded, pit-run gravel passing a 1 1/2-inch screen. Trucked to the job site and deposited on prepared berms at the top of the lining on either side of the canal, it is later placed along the slide slopes and bottom of the excavation. On smaller sections, the material is deposited directly into over-excavated canal sections, then trimmed to neat lines.

The cushion-course material is being compacted just ahead of concrete lining operations. After material has been spread along about 200 feet of the excavation, the 22-B doubles back and picks up a smooth steel-wheel roller to start compaction. The crane operates the roller by means of a hoist line and drag cable. As the crane moves along on the canal berm, the operator uses both cables to work the roller so that the canal grade is generally left about 1 to 2 inches high. This gives the trimmer something to work on.

Although the canal trimmer was shop built, it is a conventionally pat-

terned machine with two endless bucket lines. These, and the rig itself are powered by a pair of International U2A diesels. As the bucket lines dig from the top of the slope to a center point at the bottom, an elevating loader carries the material to a discharge conveyor above canal level. This conveyor can be changed so that the machine discharges excess material on either side of the canal.

All buckets on the rig are equipped with H & L teeth, which can be easily replaced when they are worn. The entire trimmer is mounted on a wheel-type frame that rides on a wide-gage railroad track on each side of the canal.

Concrete lining

One of the fastest phases of the job is the placement of the 2-inch concrete lining in the 10-mile canal section. On one day, 1,900 feet of the 4-foot lining in the bottom of the canal was placed in a 10-hour shift.

Two company-built slip-form liners, a large machine that is wheel-mounted on railroad tracks and a small model that is skid-mounted and

(Concluded on next page)



As the small liner puts down the 2-inch lining, finishers follow. The 5-batch truck dumps to the skip of the Koehring 16-S rubber-tire paver, which gets water from the 750-gallon trailer.

Where digging is too hard for the Trenchliner, drilling and shooting are required. In this area, an Ingersoll-Rand wagon drill, powered by an I-R 315-cfm compressor, puts down a powder hole.



Aluminum tractors, platform trailers

■ "The Road to Payload Profits," a 50-page booklet published by The Aluminum Company of America, describes and illustrates aluminum truck bodies and truck tractors. Dump bodies, platform trailers, and other units are illustrated. A weight-rate-profit chart, and the monetary advantages said to result from use of aluminum in these units are among the data included. Case history reports from fleet owners are also covered.

To obtain this booklet write to The Aluminum Company of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa., or use the Request Card at page 18. Circle No. 30.

self-propelled, are doing this work.

The large machine consists of a top deck, with a receiving-distributing hopper, on which the operator works. On the bottom platform, a vibrator man is stationed. Syntron vibrators are mounted at this point, near the trailing screed. Four Buda jacks, one at each corner of the machine, permit it to be leveled in relation to a string line outboard from the slip-form, and this has proved more successful and economical than having railroad track sections tamped to exact line and grade.

The small slip form is used on ditches having a bottom width of less than 4 feet. It is similar in construction to the larger machine, except for the steel skids that ride on the bottom grade, giving the machine the necessary clearance to lay a 2-inch lining. Both machines place and finish concrete in virtually the same manner.

Aggregates and sand are furnished to batch plants at the job site by Connell Sand & Gravel Co. from a commercial plant about 25 miles from the project. The construction company buys its own cement. A subcontractor, Charles R. Watts & Co., Seattle, is furnishing Darex air-entraining agent and Hunt Process Clear curing membrane to the job. This material, and the joint filler, is being applied by Watts' crews.

A Scoopmobile front-end loader charges the bins of the Noble batch plant, dumping at ground level to a temporary surge hopper that feeds an elevating bucket loader leading to the plant bins.

Concrete is batched to a fleet of four 5-batch trucks that haul to a Koehring 16-S rubber-tire paver at the slip-form. The 3/5-yard batches are dumped from the trucks to the paver skip, where water is added. Water is supplied by a 750-gallon trailer towed behind the paver. Fresh concrete is dumped directly into the paver, and as it moves along, several cement finishers work the material from a platform behind the paver.

Contraction joints, cut 1 inch deep on 15 foot centers, are being filled with a mixed blend of Hunt cold joint-filler, a liquid mixed with Hunt cold joint-filler powder. **THE END**

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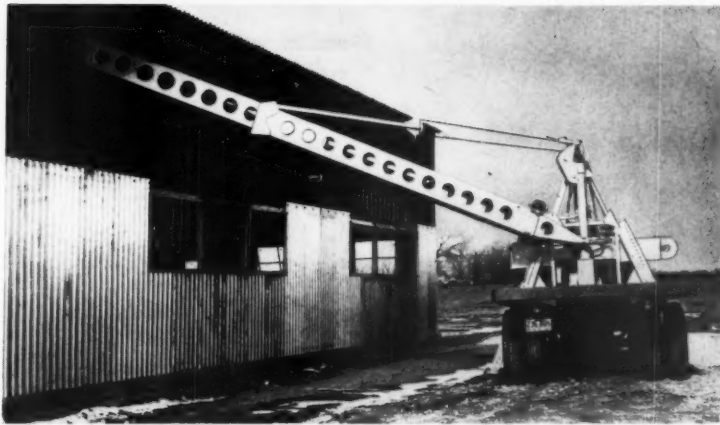
CONTRACTORS AND ENGINEERS

Hydraulic crane features precision control

■ A boom that will telescope hydraulically with a full-capacity load is one of several improvements in the new Model 60 Pitman Hydra-Lift truck-mounted crane.

The Model 60 is a completely redesigned version of the Model B Hydra-Lift, a 6,400-pound crane requiring only 40 inches of space behind a truck cab. The Hydra-Lift installs on any 2-tons or larger truck.

Basic improvements include the hydraulic boom. This can position loads in spots which would be virtually impossible to reach with any type of standard boom. Offered as optional equipment, the hydraulic boom telescopes from 17 to 27 feet. The stand-



Hydraulic control makes it possible to spot loads precisely with the new Pitman Hydra-Lift crane.

ard tubular boom telescopes manually from 12 to 17 and to 22 feet.

Hydraulically-operated outriggers are now standard equipment. Two levers which the operator can easily reach without moving from his regular operating station control the outriggers.

Furthermore, full-capacity loads can be raised or lowered with the boom. For heavy loads it was formerly necessary to first position the boom, then raise the loads with the loadline.

The Hydra-Lift is shipped complete with hydraulic cylinders, loadline winch, hydraulic pump, sheaves and cable, and hydraulic tubing. Hydraulic hose has been replaced with seamless steel tubing.

For further information write to the Pitman Mfg. Co., 300 W. 79th Terrace, Kansas City, Mo., or use the Request Card at page 18. Circle No. 148.

Magnetic plate clamp simplifies welding jobs

■ A new welding plate clamp distributed by Portomag Sales, Inc., 1511 E. Nine Mile Road, Ferndale 20, Mich., eliminates the need for supporting clamps or driving wedges in butt or lap welding.

The Porto-Magnetic plate clamp is a self-contained unit combining a



The Porto-Magnetic plate clamp makes welding of heavy metal plates a one-man job.

powerful magnetic base and a fast-operating jack. In welding, the clamp is placed with the jack over the warped plate. Once the current is turned on, a few fingertip turns of the ratchet lever result in perfect alignment, according to the manufacturer. Both hands are free to complete the weld.

For normal maintenance welding operations, the Porto-Magnetic clamp has a flat base. Contour shoes are available to fit any size radius for welding tanks, boilers, and other curved surfaces.

The magnetic base of the tool has a lifting power in excess of 3,000 pounds.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 100.

Texas Co. opens technical service office in South

To expand its specialized service to southern industry, the Texas Co., New York, N. Y., has opened a regional office of its technical service division in Atlanta, Ga.

Located at 873 Spring St. N. W., Atlanta, the office will be headed by J. F. Collins, Jr.

miracle concrete form panels
may be re-used 125 times!

This overlaid fir plywood...proved lowest cost re-use concrete form material

Harborite is ideal for heavy construction concrete work. Resin-impregnated sheets are permanently bonded to the solid wood core... providing a smooth, long-wearing, abrasion-resistant surface that's 100% waterproof. The overlaid faces will not run, bleed or discolor concrete and have a special affinity for oils and other form finishes. High re-use factor (50 re-uses are common, 125 re-uses are not unusual) assures important savings. Available in over-size panels and standard 4'x8' size in any thickness.

Ultimate Number of Re-Uses

- Mirror Smooth Surfaces
- Less Stripping Time
- Reduced Finishing Costs
- Lower Fabrication Costs

HARBOR
PLYWOOD CORPORATION

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Indianapolis, Indiana
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SAN FRANCISCO, California
3095 Third Street • VA 6-2411
SEATTLE, Washington
North 34th and Fremont • EV 2228
TAMPA, Florida
802 North Rome Avenue • Phone 8-1868

For more facts, use Reader-Reply Card opposite page 18 and circle No. 224



A Link-Belt Speeder swings a 1-yard bucket of concrete into position for the pour. Specifications require a total of 2,400 cubic yards of concrete.

Need for costly detour span is eliminated by opening completed lanes; bridge replaces 92-year-old span

Bridge traffic uses north lanes as south lanes are constructed

Completing a \$313,000 bridge over the Boise River in Idaho to its full 442-foot length and half its four-lane width eliminated the need for a detour span by permitting traffic to use these two lanes while the other two were being built. Designed by Smith & Milhallin, consulting engineers of Boise, the 68-foot-wide bridge has a raised dividing strip and longitudinal construction joint on the center line.

The new monolithic seven-span T-beam girder-type concrete bridge is being built by Eagle Construction Co., Boise, to replace three old trusses which have been in place on Broadway, one of the town's busiest streets, since 1863. Duplicate spans progressing in lengths of 48, 56, and 72 feet from both ends to the channel center span of 90 feet make up the 442-foot length. The substructure, skewed 45 degrees with the roadway to parallel the main channel, keeps the bridge center line on the approach tangent and minimizes damage from scouring.

The old structure was dismantled on supporting cribs and swung clear with a Link-Belt K-370 Speeder. Heavy gravel for pier footings was excavated by a TD-24 dozer with 2-yard drag bucket. A 5-foot-deep concrete seal was placed as a leveling course.

Footings and piers have been placed in the dry, and three centrifugal pumps with a total standby capacity of 2,000 gpm handled seepage.

Each set of forms can be re-used 12 times because the vertical wedge staves at the tapered circular sections are treated with A. C. Horn Plastic Formfilm and lined with Mascote. This also speeds erection so that four carpenters and two helpers can strip and re-erect two columns each 8-hour shift. Chausse-Swan Gravel Co. is furnishing the 2,400 cubic yards of transit-mix concrete in Rex and Challenge 5-yard mixers. The concrete is then dumped directly to a 1-yard bucket and swung into position by the Speeder.

At its present rate of progress, the job should be completed by June, 1956, two months ahead of the required completion date.

Personnel

Superintendent for Eagle Construction Co., is H. L. Wingfield. Resident engineer for the state is Marcey Laragen, assisted by Don Meldon.

THE END

CONTRACTORS AND ENGINEERS



Goes anywhere! The Universal 'Jeep' is often the first equipment to reach a construction job, and the last to leave. With the extra traction of its 4-wheel drive, it takes engineers over the roughest ground for first surveys. During construction it carries men and tools wherever they are needed, on or off the road. And when the job is done, it helps speed final inspection work.

How 4-wheel drive 'Jeep' vehicles help contractors save time and money!



'Jeep' with hoist lowers lighting equipment in a bridge deck installation. Because of its light weight, the 'Jeep' can haul materials over new concrete before it is strong enough to support heavy trucks.



'Jeep' Truck with hydraulically-operated back hoe prepares foundations, digs laterals or drainage ditches, and does other jobs too big for hand digging but too small for heavy-duty earth-moving equipment.

Vehicles in the 'Jeep' family help speed work and cut costs in almost every phase of construction.

In 4-wheel drive they go up steep grades—through mud, sand and soft earth—where other vehicles can't go. They shift easily into 2-wheel drive for travel at highway speeds. With power take-off or hydraulic lift, they operate many types of equipment from dozer blades to mobile drills for soil sampling. They stand up to the toughest usage—save you valuable time on job after job. Ask your nearest Willys dealer for an on-the-job demonstration or write for information.

The 'Jeep'

family of 4-wheel drive vehicles

WILLYS...makers of the world's most useful vehicles

WILLYS MOTORS, INC., TOLEDO 1, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 225



The PIAB dynamometer, available in capacities from 500 to 80,000 pounds.

Swedish dynamometer now available in U. S.

■ The compact, rugged PIAB dynamometer, in use in Europe for some time, is now available to the American and Canadian markets through the Walpole Co., 419 Boylston St., Boston, Mass. Equipped with annular conical springs of high compressibility, the unit is said to offer accuracy within one per cent. A short rod-pull movement gives the dynamometer a long service life.

Elimination of spring fatigue means that no calibration curve is needed throughout the life of the instrument. Antifriction ball bearings support the measuring dial indicator.

Made in Sweden, the PIAB dynamometer is available in capacities from 500 to 80,000 pounds. Types L, C, and D, in capacities up to 2,000 pounds, are only 9 inches long and weigh 3.2 pounds.

The mechanism and dial are totally enclosed, making the unit both dust and water-tight. Fully damped against sudden increase or decrease in load, the unit is not affected by varying impulses or by rough handling. Zero setting is accomplished quickly with an Allen wrench, supplied with the instrument.

For further information write to the company, or use the Request Card at page 18. Circle No. 111.

Conveyor-belt carriers

■ Flow charts, action shots, diagrams, and specification tables point out the features of Stephens-Adamson Mfg. Co.'s complete line of conveyor-belt carriers. Data on special carrier units, trippers, etc., is also included.

To obtain Bulletin 355 write to Stephens-Adamson Mfg. Co., 275 Ridgeway Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 6.

Goodall opens branch

A branch office and warehouse has been opened in Kansas City, Mo., by the Goodall Rubber Co. of Trenton, N. J. Under the management of D. E. Hammock, the branch will maintain stocks of industrial and chemical rubber products.

For more facts, circle No. 226→

Torque wrench has high capacity

■ Though a 600-foot-pound torque wrench would ordinarily be large and unwieldy, the P. A. Sturtevant Co., Addison, Ill., has developed a multi-purpose wrench of convenient size capable of exerting 600-foot-pounds of pressure. The tool can be used for structural work, such as fastening high-tensile steel bolts, or for work on heavy road equipment.

The Sensory Model, equipped with an extension to get maximum pres-

sure, signals the operator in three ways when the preset torque is reached. At preset torque, a mechanism imparts a strong impulse to the handle and an audible sound is made. The operator may also check the torque by reading the graduated scale on the wrench.

Used alone, the torque wrench has a 300-foot-pound capacity. A 600-foot-pound capacity is possible with the use of the heavy-duty extension equipped with a multi-purpose 3/4 and 1-inch drive square to fit all standard series sockets.



The Sturtevant high-torque wrench.

For further information, write to the manufacturer, or use the Request Card at page 18. Circle No. 106.

Install Chrysler Industrial Engines

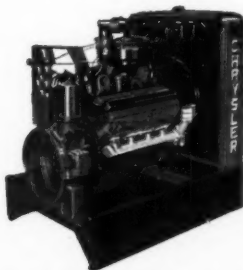
... best-engineered, most-economical answer to your power problem

Chrysler Power is the dependable, economical, lightweight answer to your high-speed or high-torque power requirements. Within their power ranges, each Chrysler Industrial Engine is a leader in the field and is recognized as such by manufacturers of almost every type of self-powered equipment.

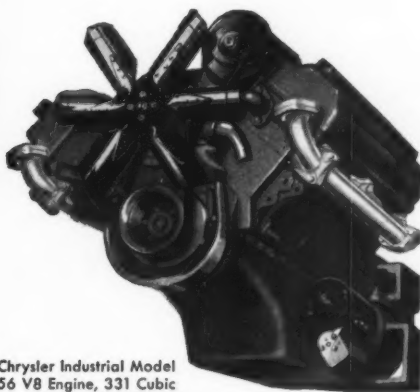
Check the specifications. Note the optional equipment which can be factory supplied or installed to meet the

particular requirements of your equipment in the field. Whether equipped for Gasoline, Distillate Fuel, Propane or Natural Gas operation, Chrysler Industrial Engines offer definite advantages . . . performance, ease of maintenance, fast parts service, low initial and operating costs.

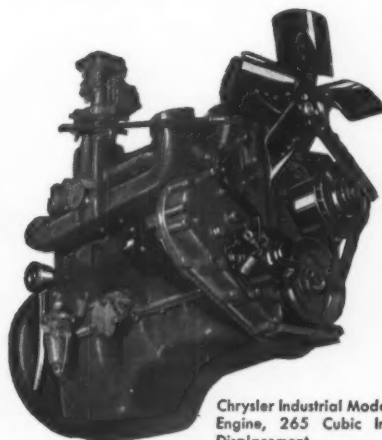
See the dealer nearest you, or write for complete information. Dept. 92, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.



Chrysler Open Power Units. The open power units for all engines include the complete engine, skid base, radiator, instruments and instrument panel, flywheel and flywheel housing. Open power units for V-8 Models Ind. 32 and 56 (pictured), include twenty-five gallon fuel tank.



Chrysler Industrial Model 56 V8 Engine, 331 Cubic Inches Displacement (Front End Chain Drive)



Chrysler Industrial Model 33 Engine, 265 Cubic Inches Displacement (Front End Gear Drive)



Chrysler Enclosed Power Units. The enclosed power units have the complete engine, fuel tank (Models Ind. 30, 31, 32 and 33—sixteen gallon. Models Ind. 52 and 56—twenty-five gallon), storage battery, instruments and instrument panel, flywheel, flywheel housing, skid base and completely enclosing sheet metal.

Optional Equipment—Chrysler Engines

Chrysler Industrial Torque Converter
Chrysler glycol Fluid Coupling
Three, Four or Five-Speed Transmission
Twelve or Twenty-four Volt Electrical System
Distillate, Propane or Natural Gas Burning Carburetor
Over-Center Clutch and Power Take-Offs
Vertical or Horizontal Magneto
Flexible Coupling for Truck-Type Flywheel
Radio Shielding and Ignitors
Heavy-Duty Oil Bath Air Cleaners
Safety Switches (Low Oil Pressure, High Water Temperature)
Corrosion or Fungus Resistant Electrical System

GENERAL SPECIFICATIONS

ALL MODELS

	Ind. 30	Ind. 31	Ind. 32	Ind. 33	Ind. 52	Ind. 56
No. of Cylinders	6	6	6	6	8	8
Type of Engine—4 Cycle	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Bore—Inches	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4
Stroke—Inches	4 1/2	4 1/2	4 1/2	4 1/2	3 1/2	3 1/2
Displacement—Cu. In.	230	230	265	265	270	331
Compression Ratio	7.0	7.0	6.8	6.8	7.5	7.5
Valves—Arrangement	L	L	L	L	Vee	Vee
Pistons—No. Rings	4	4	4	4	3	3
Crankshaft—Bearings	4	4	4	4	5	5
Camshaft Drive	Silent Chain	Gear	Silent Chain	Gear	Silent Chain	Silent Chain
Camshaft—Bearings	4	4	4	4	5	5
Crankshaft—Bearing Diameter	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
Lubrication—Type	Press.	Press.	Press.	Press.	Press.	Press.
Lubrication—Type Oil Pump	Rotor	Rotor	Rotor	Rotor	Rotor	Rotor
Lubrication—Oil Capacity Qts.	5	5	5	5	5	5
Ignition—Battery Type	Yes	Yes	Yes	Yes	Yes	Yes
Spark Plug—Size	14 mm	14 mm	14 mm	14 mm	14 mm	14 mm
Starting—Elec. Type	6 Volt	6 Volt	6 Volt	6 Volt	6 Volt	6 Volt
Gen. Reg.—Full Voltage	45 Amps.	45 Amps.	45 Amps.	45 Amps.	45 Amps.	45 Amps.
Gen. Reg.—Full Voltage and Current Control	Yes	Yes	Yes	Yes	Yes	Yes
Carburetor—Type	Down-Draft	Down-Draft	Down-Draft	Down-Draft	Down-Draft	Down-Draft
Fuel Pump	Yes	Yes	Yes	Yes	Yes	Yes
Weight—Approx. (Lbs.)	575	610	740	760	591	845

Specifications subject to change without notice.

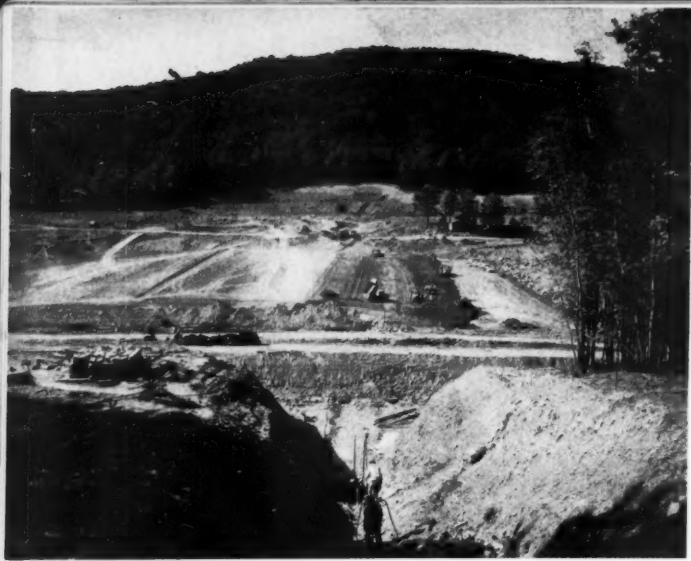
HORSEPOWER



WITH A PEDIGREE

CHRYSLER INDUSTRIAL ENGINES

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION



An over-all view of the site for the 1,450-foot dam. Grouting operations are under way in the foreground. Excavation in the background is for the spillway and west cutoff wall.

Construction of earth-fill dam waits until oil wells are sealed

**Presence of wells in proposed pond area creates hazards;
foundation condition requires high compaction in dam**

of about 15 bags per minute, and about 300 bags were required to complete the sealing job, including the work of topping off after tubing was pulled. In many cases, the presence

of large underground voids made it necessary to stop pumping long enough to allow a charge to set before the filling operation was continued.

Land clearing, as well as the con-

Before construction begins on a reservoir, the first job usually encountered is that of clearing the land. But this was not the case with the \$1,850,000 water-supply project built for the Bradford City Water Authority, Bradford, Pa.

Scheduled to be completed this summer, the 700-million-gallon-capacity reservoir is being built in the area of the Bradford oil fields, and even before land clearing could be started, the 36 producing or abandoned oil wells on the site had to be eliminated. These wells, scattered over the pond area, not only presented a contamination danger, but also made it possible for water to be lost in below-ground formations.

After a detailed study by the water authority and local petroleum-engineering experts, officials decided to clear the wells of old casing, tubing, and debris, then plug them solid with cement. This shut off crevices in the hole that might endanger the potability of the reservoir water.

Cleaning operations, handled by a local crew employed by the water authority, had a Northern Ordnance drilling rig called a "spudder" or "yo yo", and cleaning tools to open the holes, some of them to a depth of 1,500 feet.

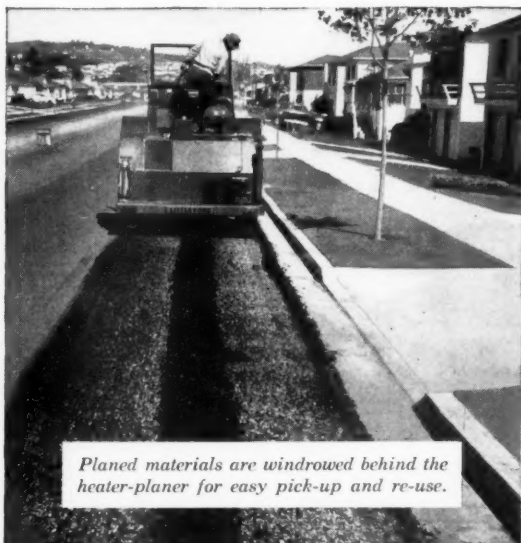
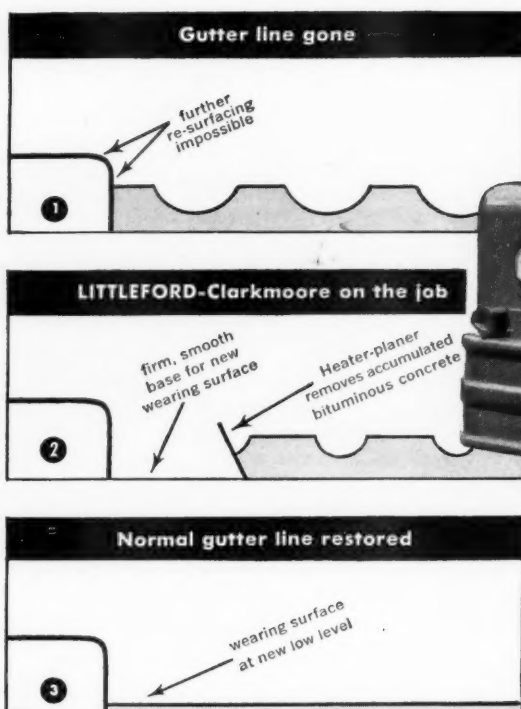
Holes are sealed

Since there were no roads in the area and the ground was soft from heavy rains, Halliburton Oil Well Cementing Co., Duncan, Okla., had to use a Caterpillar D6 tractor to haul its truck-mounted equipment into the reservoir site when holes were ready to be sealed. This equipment consisted of a jet-type mixing unit and a delivery pump mounted on the bed of a six-wheel FWD truck having a gross weight of 13 tons.

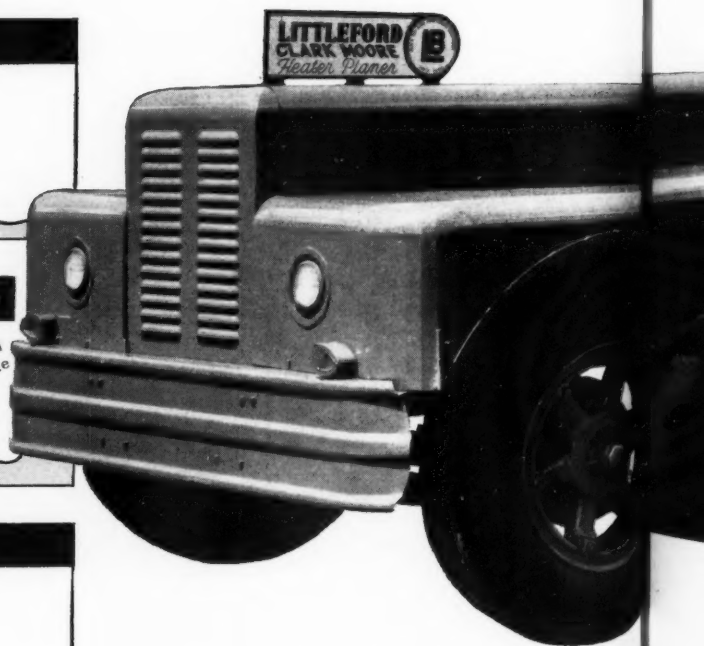
Cement was pumped into the unit's 2-yard hopper, and water picked up by a Moyno jet pump was mixed in a tub mounted at the side of the rig. The mixture used had a weight of about 15 pounds per gallon. The mixture was then pumped into the steel well tubing. These were usually 2 inches in diameter. In the deepest wells, pressures as high as 1,000 psi were required to deliver the mix.

The rig mixed cement at the rate

Save 63¢ yd. on Blacktop



Planed materials are windrowed behind the heater-planer for easy pick-up and re-use.

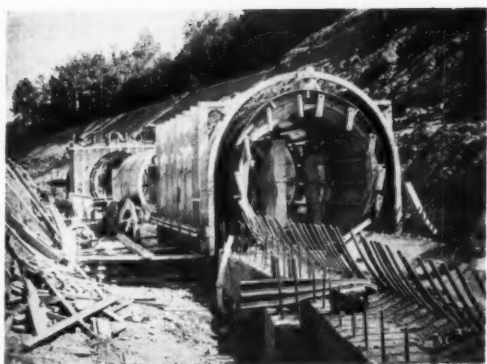


use the LITTLEFORD

The Littleford-Clarkmoore Heater-Planer smooths the road surface so smooth you can surface course directly on it . . . thus introducing a whole new technique in road maintenance. This ingenious giant—at last—permits the re-surfacing of city streets. Adequate maintenance has been impossible heretofore because of the lack of an efficient tool for removing bituminous concrete accumulated layer after layer year after year.

Now the Littleford-Clarkmoore Heater-Planer not only removes the excess material, heats and planes a firm, smooth base for new surface and helps keep it at the proper

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Workmen prepare some of the prefabricated steel forms, made by the Posey Iron Works, Lancaster, Pa., which are being used in the construction of the 8-foot concrete diversion conduit.



While the dam is being built, the 5-mile 24-inch line from the reservoir to Bradford is being laid. A Bucyrus-Erie 22-B crane lowers sections of the cast-iron pipe into the trench, where they are connected with Dresser couplings.

Top Maintenance*



***SEE the facts!**

New sound film shows how this ingenious giant saves you real money. Ask your dealer to arrange a showing.

Littleford-Clarkmoore Heater-Planer

The efficiency of the Littleford-Clarkmoore Heater-Planer comes from this unique combination of Littleford engineered advances:

- ★ hydraulic creeper gear drive that moves the Heater-Planer smoothly and steadily at all speeds from 8-inches up to 35-feet per minute, yet keeps the engine running at a constant 1200 rpm.
- ★ planing depth that ranges from a skin cut to 1" thick.
- ★ overlapping double-bladed planing action that covers a path 81" wide and windrows the material for pick-up and re-use.
- ★ ingenious heating system that provides a balanced ratio between heat penetration and forward speed.

And don't forget the many other uses of the Littleford-Clarkmoore Heater-Planer:

- ★ Levels out troughs on straight-aways.
- ★ Smooths out corrugations on hills, at traffic lights and stop signs.
- ★ Planes off top surface to prepare for surface treatment.
- ★ Removes fatty sections or slippery places.
- ★ Roughs up bad hills to avoid skidding.

Before you buy, check the Littleford-Clarkmoore. You'll find it the perfect tool for better black top maintenance. Write for bulletin FF-18. Littleford Bros., Inc., 485 E. Pearl St., Cincinnati 2, Ohio.



LITTLEFORD

TOPS IN BLACK TOP

struction of the 400,000 cubic yard earth-fill dam, an 8-foot concrete diversion conduit, spillway, and control tower, was awarded to Buck & Donohue, Newark, N. J., for approximately one million dollars.

All trees more than 2 inches in diameter in the 125-acre pond area were pushed over by Allis-Chalmers HD-24 and International TD-14 bulldozers. Also assisting in this operation was a Bucyrus-Erie 22-B crane with clam bucket. These machines eliminated the need for disposing of stumps, since the trees were torn out by the roots. Trees smaller than 2 inches in diameter were sawed off at ground line with Homelite chain saws. All timber and trimmings were piled up and burned.

When stripping for the earth dam started, it was expected that the removal of a few feet of ground would expose a suitable foundation for the dam. But the contractor ran into waste and glacial material that went 70 feet deep, and about 8 to 10 feet of this had to be removed before a firm bed for the dam was found.

Fill for the dam is being obtained from the spillway excavation, the excavation for the 8-foot diversion conduit, the excavation for the temporary stream-diversion channel, and from a borrow pit about ¼ mile upstream from the dam in the reservoir area. A fleet of Mack 10-wheel trucks and Allis-Chalmers 14-yard scrapers are hauling fill to the dam site. Trucks are being loaded by a Lorain 2½-yard shovel.

Because of the unusual foundation condition, the dam does not have a core wall but requires a density of 90 per cent Proctor. Slusser-McLean sheepsfoot rollers, working on the dam, are topping this requirement, providing about 94 per cent of standard Proctor density with a compactive effort of 310 psi per roller foot.

Currently work is continuing on the dam itself, concrete structures, excavation for concrete work in the spillway area, and the 8-foot diversion conduit, which is being built with the new prefabricated steel forms made by Posey Iron Works, Lancaster, Pa.

Construction of a 5-mile cast-iron water line, 24 inches in diameter and

joined with Dresser couplings, is being done under a separate contract by Fago Bros., Buffalo, N. Y.

The design engineering and supervision is being performed by Gannett, Fleming, Corddry & Carpenter of Harrisburg, Pa. The project engineer is J. A. Romano, and the resident engineer is B. D. Johnson. The field superintendent for the contractor is John Gschwendtner. Arthur C. Simmons, consulting engineer and A. J. Saxe, vice president of the South Penn Oil Co., worked with the Bradford City Water Authority on the job of sealing the wells. THE END

New charts are included in 1956 Gurley Ephemeris

■ The 1956 pocket-sized edition of the Gurley Ephemeris includes new charts that make it possible for Polaris to be determined in a fraction of the time formerly required. The annual publication also includes an almanac listing 28 selected stars for determining stellar observations, charts for the sun and Polaris, definitions of astronomical terms, and many sample problems.

An abridgement of the American Nautical Almanac, the new edition gives complete instructions for determining azimuths by methods similar to those used in observations of the sun and Polaris. The 96-page booklet also includes tables, abridged from the American Ephemeris and Nautical Almanac, and the Standard Field Tables of the Bureau of Land Management. These include tables on the sun's apparent declination and equation of time at 0 hours Greenwich Civil time for each day of the year, mean refractions in altitude and declination, semi-diameters and Parallax of the sun, upper culmination and elongation of Polaris, Azimuth of Polaris at Elongation and at all hour angles, logarithms of numbers and functions, natural functions, and conversion tables at decimal parts. Practicing surveyors and engineers, and instructors of surveying may obtain copies of the Ephemeris without charge.

To obtain this literature write to W. & L. E. Gurley, Troy, N. Y., or use the Request Card at page 18. Circle No. 97.

Materials reference book

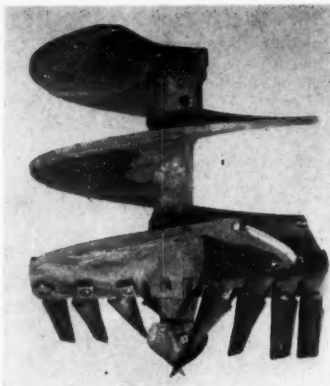
■ A 100-page pocket reference booklet, "Facts and Figures", has been published by Pioneer Engineering Works. Up-to-date information on materials and their uses, as well as aggregate specifications, feeder capacities, electrical data, earthmoving-equipment formulas, tank capacities, trigonometric functions, and standard gages of wire are covered in tables and charts. There is an eight-page glossary of terms of the trade.

To obtain this booklet write to Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 147.

Reversible auger teeth have long service life

■ A new reversible tooth available in two sizes has been announced by Petersen Engineering Co., 460 Kifer Road, Santa Clara, Calif. Designed for use on earth-boring augers and cutting heads, the teeth feature long-wearing surfaces, and may be positioned to bore without down-pressure.

They may be reversed after they are worn out on one side. The more efficient boring angle permits boring in most instances without any down pressure at all, eliminating wear on



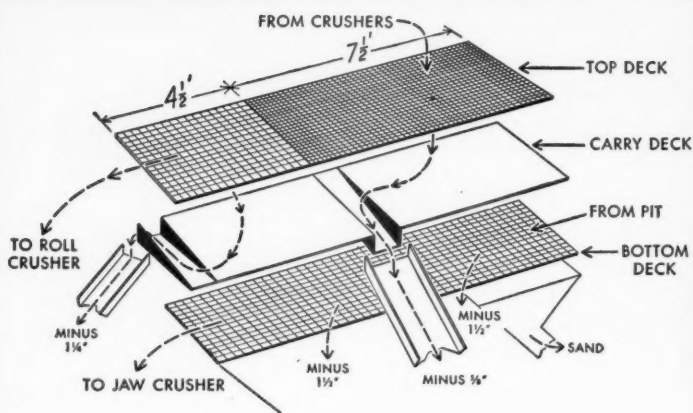
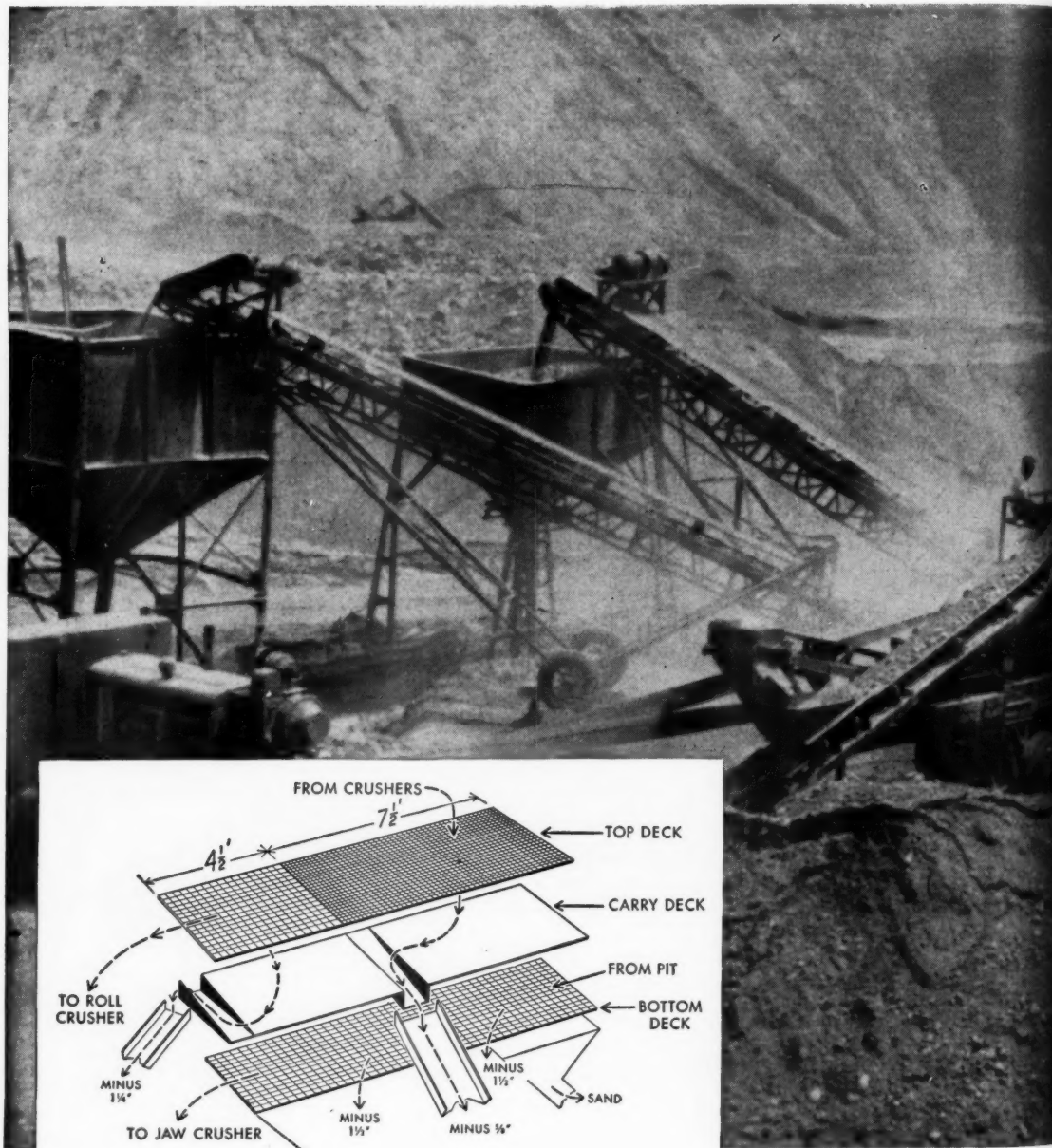
The new Pengo Wisdom Tooth for earth augers.

clutch-plates and eliminating waste of power formerly required for down-pressure.

The new No. 49 Pengo Wisdom Tooth is especially designed for use on augers powered by heavy and extra-heavy duty boring machines, and the No. 41 Pengo Wisdom Tooth is designed for use on medium and lightweight machines.

For further information write to the company, or use the Request Card at page 18. Circle No. 142.

Last year 36,000 people lost their lives in traffic accidents, and 100,000 suffered permanent disabilities.



Duplex plant produces for three jobs at same time

SIMULTANEOUSLY TURNS OUT TWO SIZES OF FRACTURED STONE TOGETHER WITH CONCRETE AGGREGATES OR ROAD GRAVEL

If you are a contractor or gravel producer you'd probably be satisfied if your portable plant could produce 100% crushed material meeting a given set of specifications... and you'd probably feel that the plant would be doing all you had the right to expect of it.

To produce this 100% fractured material with an ordinary duplex plant you'd most likely have to use an auxiliary screening unit ahead of your duplex so all your material fed to it would be crushed.

But Fred Ward isn't so easily satis-

fied. In a pit near Detroit, Michigan, he's turning out two different sizes of fractured rock to meet the rigid specifications of the State Highway Department. In addition, he's producing road gravel.

... and at times, he's producing all 3 products simultaneously... with one portable plant!

State specifies fractured rock

Michigan, like so many other states, is recapping a considerable mileage of old pavements with asphalt materials. The State Highway Department

requires that these materials contain 100% fractured particles in order to give the asphalt mat a definite stability.

According to present state specifications, the base course must be rolled to a 1 1/2" mat and must contain minus 1 1/4" products with 0-10% passing a #4 mesh (Spec. 9AA).

3/8" minus rock for top mat
The top mat must also be made up of 100% fractured material, all of it passing 3/8", with 0-10% passing a #10 mesh (Spec. 25A).

And to further complicate matters, Ward had to meet these specifications from materials retained on a

The Vanco metallizing machine made by the Vandersee Corp., features a simplified air-governor control.

New metallizing machine has air-governor control

A simplified air-governor control is featured on the new Vanco metallizing machine made by the Vandersee Corp., Route 22, Union, N. J. A dynamically balanced air turbine provides positive power control which feeds metal wire without fluctuation.

The turbine is automatically governed by the propulsion fluid supplied to the primary and secondary tur-



bines. These are so arranged that their opposing forces are in direct proportion to the change of volume or pressure of the fluid supply.

Weighing less than 4½ pounds, the new unit has a self-contained gas-mixing chamber nozzle that eliminates the danger of backfiring, according to the manufacturer.

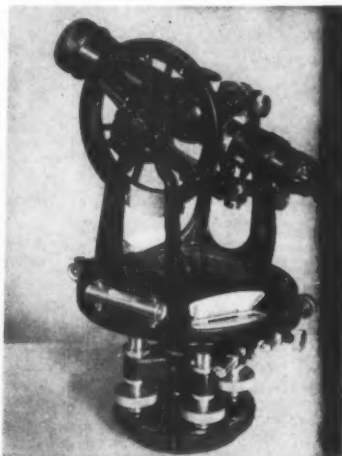
For further information write to the company, or use the Request Card at page 18. Circle No. 135.

Metal hose

A reference manual from Universal Metal Hose Co. gives the use and

application of metal hose products made in bronze, carbon steel, monel, nickel, or stainless steel. These hoses are said to compensate for conditions of varied pressure, elevated temperature, motion, vibration and a wide range of conveyance problems.

To obtain Catalog U-333 write to Universal Metal Hose Co., 2133 S. Kedzie Ave., Chicago 23, Ill., or use the Request Card at page 18. Circle No. 55.



The Sokkisha engineer's transit distributed by the Opplum Co.

Japanese-made transit offered in three models

A Japanese-made standard 5½-inch engineer's transit available in three models is distributed in this country by Opplum Co., Inc., 83 Uhland St., East Rutherford, N. J. The models have vernier readings to one minute, 30 seconds, and 20 seconds.

Features of these Sokkisha precision-built transits include an achromatic terrestrial erecting telescope, horizontal limb and vertical circle both graduated on solid silver, rugged U-type standard, stain-free glass vials, and leveling screws protected with dust caps.

The instruments have a baked-on enamel finish. Weight is about 16 pounds. Accessories include a front-opening hardwood case with handle, carrying strap, and lock and key. The case includes plumb bob, sunshade, magnifying glass, screw driver, and adjusting pins.

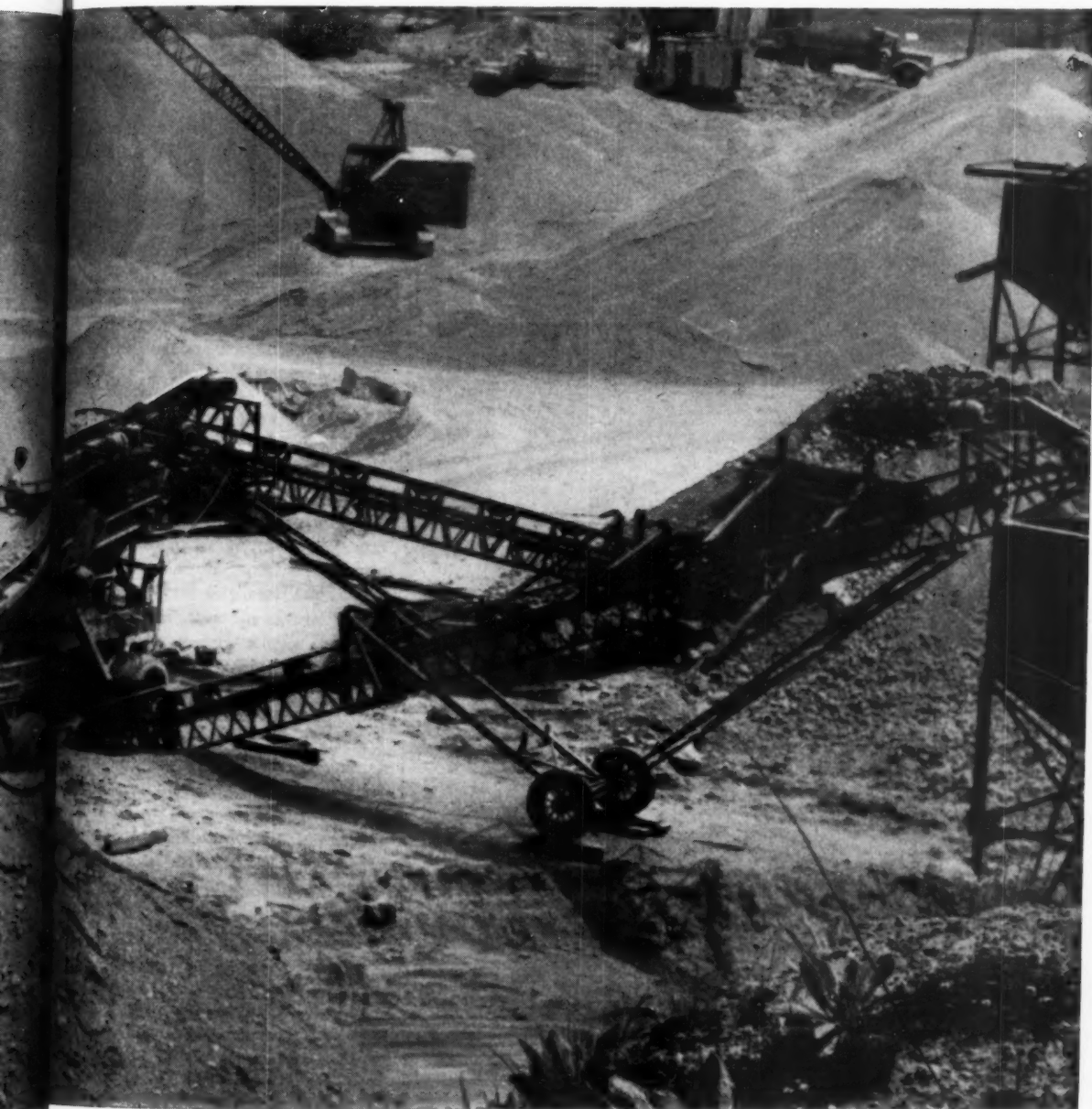
These transits mount on any standard tripod.

For further information write to the company, or use the Request Card at page 18. Circle No. 127.

Welding-helmet attachment

A bulletin from American Optical describes a welding helmet attachment that fits all peak-type safety caps. This No. 5000 Speedy attachment consists of two rugged steel clips with insulated prongs to grip the edge of the cap. The outstanding features of the band are given.

To obtain Bulletin No. 43 write to the Safety Products Division, American Optical Co., Southbridge, Mass., or use the Request Card at page 18. Circle No. 64.



1½" screen, leaving a considerable proportion of the pit-run to be disposed of.

How problem was solved

Fred Ward solved his problem by bringing in a PIONEER 46VE Bottom Deck Feed Plant.

Pit-run material is fed to the bottom deck of the 46VE's 3½ deck vibrating screen. Here, all material passing the 1½" mesh is removed and can be delivered to a nearby washing plant for washing, sizing, and stockpiling for use as concrete aggregate or road gravel.

Rock retained on the 1½" screen then passes through the 1036 jaw crusher which is set at approximately 2¾". The 2¾" minus material is then sent to the 12" top deck.

Here, the first 7½' of the deck is equipped with ¾" openings, the last 4½' with 1¼" openings.

Oversize is fed to the 4022 roll crusher set at slightly less than 1¼" in a closed circuit with the top deck.

The unusual sizing job was accomplished with only two modifications to the standard PIONEER 46VE. First, built-in chutes in the center deck were sloped from one side to go across the screen so that ¾" minus rock would be delivered to one side and 1¼" minus to the other.

Second, the chutes were flared from the side of the plant to feed into PIONEER Portable Conveyors which delivered material to bins (see photo).

Engineers who have visited the site

agree that no portable plant not employing the Bottom Deck Feed principle would possess the versatility and precise control of gradation necessary to produce the varied specification materials simultaneously.

Available in 7 sizes

PIONEER Duplex Plants, featuring Bottom Deck Feed, are available in 7 different sizes. For further information, write Pioneer Engineering Works, Inc., Minneapolis 13, Minnesota (subsidiary of Poor & Company, Chicago) or your nearest PIONEER Distributor.

Pioneer
Contract Equipment

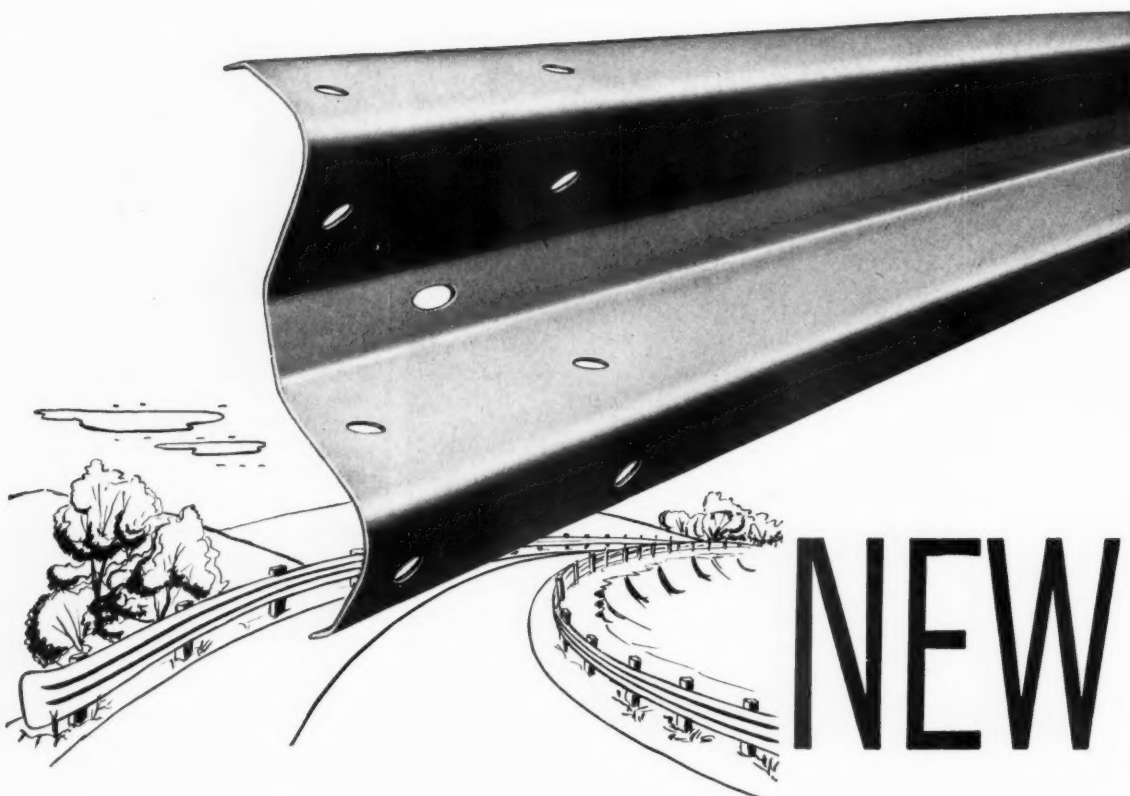
For more facts, use Reader-Reply Card opposite page 18 and circle No. 228



At far left, a 2-man crew is shown running up a truss with the Size 5340T model. This job used $\frac{3}{8}$ -inch high-strength bolts, and the minimum torque required was 470 foot-pounds.

The Size 5040T model of the new Ingersoll-Rand Torque Control Impactool has many equipment maintenance applications. In the photo at left, it is used to tighten a bronze gear wheel to the hub of a swing crane.

Nut-runner speeds bolted construction by shutting off at preset torque



NEW

ARMCO FLEX-BEAM GUARDRAIL

Provides Extra Strength—Greater Safety

Important new design changes now make Armco FLEX-BEAM Guardrail even better than before. Extra strength and greater safety have been added to the features that won wide acceptance for FLEX-BEAM from the time it was introduced in 1939. These include high beam strength, controlled flexibility, simplicity and speed of installation, high visibility and low-cost maintenance.

MORE STRENGTH

Eight sturdy bolts plus a proved FLEX-BEAM lap splice extend beam strength through the joints to make a uniformly sturdy installation. Bolt holes have been moved to the neutral axis of the section,

improving tensile strength of the joint.

GREATER SAFETY

Top and bottom edges of new Armco FLEX-BEAM are turned away from traffic. There is nothing to break the smooth rail face and provide a traffic hazard. Also important, the wide center corrugation matches modern auto bumper designs to help control colliding vehicles.

Write us for complete data on new, improved Armco FLEX-BEAM. Armco Drainage & Metal Products, Inc., 6205 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

Armco FLEX-BEAM Guardrail



For more facts, use Reader-Reply Card opposite page 18 and circle No. 229

Expected to speed structural-steel bolting is a new Ingersoll-Rand air-operated nut-running tool which impacts the nut to a desired preset torque for precision tightness, then automatically shuts itself off.

The new tool represents a major improvement in the I-R Impactools. While these tools have been used on bolted construction under certain controlled conditions, the new Torque Control model brings new accuracy to the tightening of bolts to specified torques.

The operation of the Torque Control Impactool is based on a torsion-bar principle incorporated in its design. The action of the tool's mechanism is likened, by the manufacturer, to that of a pogo stick, which bounces evenly on soft ground, but suddenly rebounds higher when it strikes a hard surface. While the nut is being run to the required torque, the new Impactool operates at normal power and speed; but when the required torque is reached and nut-running resistance is equal to the stress preset in the torsion bar, the impact mechanism rebounds instantly and trips a rubber-faced shutoff valve.

The new tool is not only expected to make structural bolting a surer and more precise operation, but also offers a saving on labor costs. In place of a four-man riveting team, bolting with this tool requires only a two-man bolting team—one to run the tool and another to hold the bolt. Testing for proper tension is eliminated. Further, no training is necessary to run down bolts or nuts with the Torque Control Impactool.

Presetting the torque is simple. A jig turns the torsion bar and calibration collar to the desired reading. Once made, the torque setting remains constant until it is changed. Performance on the job, as reported by the manufacturer, indicates that torque control remains accurate.

The model developed for steel construction has been designated Size 5340T. This size is suitable for running $\frac{3}{4}$ and $\frac{7}{8}$ -inch high-strength bolts used in heavy building erection and bridge construction. Preset at the factory at 320 foot-pounds, it adjusts through a range of 14 calibrations up to 550-foot-pounds.

A second model, Size 5040T, is

CONTRACTORS AND ENGINEERS

smaller and easier to handle. As such, it is suitable for a wide range of nut-running jobs, including equipment-maintenance work. Two torsion bars are available for this model. The L735 torsion bar has a maximum torque of 60 foot-pounds, while the H735 bar allows a maximum torque of 90 foot-pounds.

For further information write to Ingersoll-Rand Co., Air Tool Division, 11 Broadway, New York 4, N. Y., or use the request card at page 18. Circle No. 144.

Line of truck shovels

■ The "Quick-Way" line for 1956 includes four new truck crane-models and five new carriers. The rugged new models include 5-ton, $\frac{1}{4}$ -yard; 8-ton, $\frac{3}{8}$ -yard; 10-ton, $\frac{1}{2}$ -yard; and 12 $\frac{1}{2}$ -ton heavy-duty $\frac{1}{2}$ -yard units. New heavy-duty carriers are offered with specific capacities for all the new "Quick-Way" units.

Power up and down boom is standard on all models. Antifriction bearings on all high-speed continuous-rotating shafts, and all chain and sprocket drive are featured. The new line also has heat-hardened hook rollers and roller path; air-cooled clutch and brake drums; smooth, positive hydraulic system and clutch controls; advanced-design lubrication with force-feed filtered circulation and daily grease fittings centrally located on the cab; hinged, fold-out panels all around the unit for easy adjustments and maintenance; and a ventilated, full-vision cab.

For further information write to the "Quick-Way" Truck Shovel Co., 2401 E. 40th Ave., Denver, Colo., or use the Request Card at page 18. Circle No. 109.

Diesel tractor

■ The Northeast loader, for Fordson Major diesel tractors, is fully described in a bulletin from Northeast Equipment, Inc. The loader may be used by contractors, sand and gravel producers, and others for loading, backfilling, spreading, stockpiling, and excavating. Tables give the cost per hour to own and operate the loader, weights of materials in pound per cubic yard and in piles, and complete specifications.

To obtain this bulletin write to Northeast Equipment, Inc., P. O. Box 904, Worcester, Mass., or use the Request Card bound in at page 18. Circle No. 23.

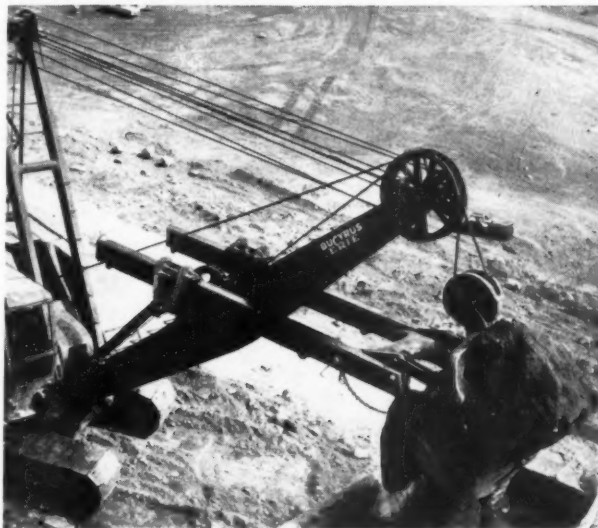
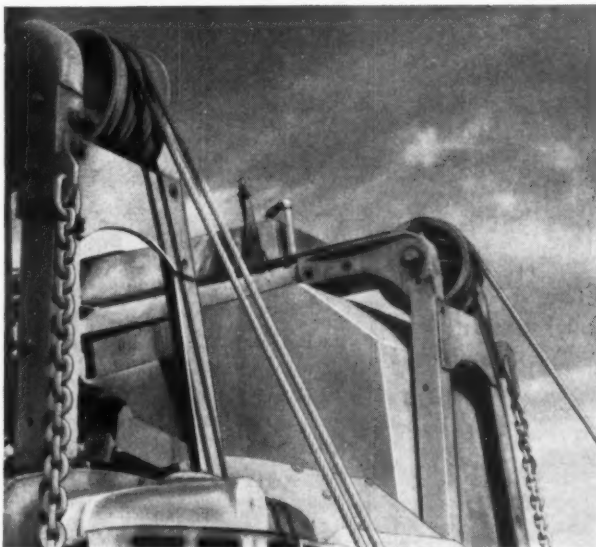
Steam cleaners

■ A catalog describes the entire steam cleaner line manufactured by Malsbary Mfg. Co. Action shots of each of the eight basic models; a chart of cleaning actions, pressures, temperatures, and capacities; and an explanation of the difference between high-pressure combination HPC models, steam-vapor models, and fireless steam cleaners are included.

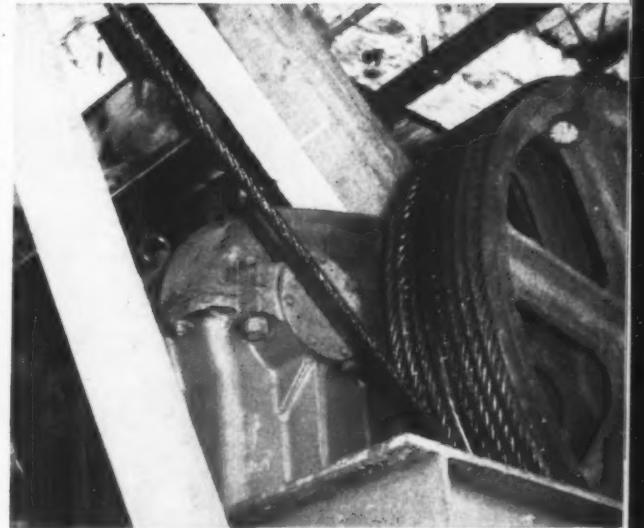
To obtain Catalog 156 write to Malsbary Mfg. Co., 845 92nd Ave., Oakland 3, Calif., or use the Request Card at page 18. Circle No. 58.



The Model 100, one of four new machines introduced by "Quick-Way" Truck Shovel Co. (Descriptive item in column 1.)



EXTRA FLEXIBILITY—Wire rope encounters fast sheave action, reverse bending, constant stop-and-start operation on many jobs. When this same rope must also lift or pull heavy loads, an unusually flexible, strong wire rope is needed.



Rope jobs like paver skip hoists, overhead cranes, large shovel and dragline hoists, and sawmill carriages demand these qualities. That's where the use of 6 x 37 Red-Strand wire rope saves time and money.

Where will 6x37 Red-Strand improve your wire rope service?

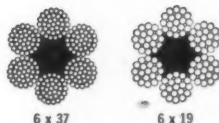
Look at a cross section of 6 x 37 wire rope. You see three rings of small, uniformly sized wires in each strand. This differs from a rope construction like 6 x 19, which contains fewer and larger wires.

The *smaller size* wires make 6 x 37 more *flexible*. The *larger number* of wires maintains rope *strength*.

Would this combination improve your wire rope service? Would it solve a problem for you?

Check with your Leschen man. He can help you.

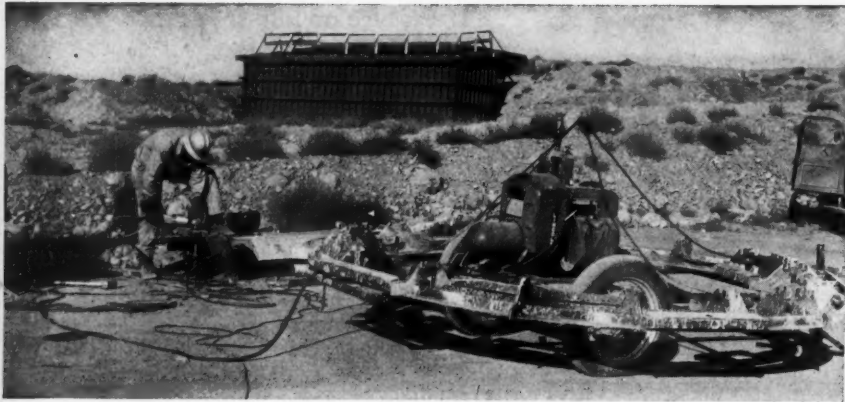
Leschen's 64-page Wire Rope Handbook tells you all about 6 x 37 and other Red-Strand wire rope constructions. Ask or send for your free copy.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 230

LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.
St. Louis 12, Missouri





The basis of a reinforcing cage is built from concentric reinforcing bars and stiffening rods by this Lincoln welder. The jig matches the size of the reinforcing cage. Here the operator leaves the unit to do a grinding job.

Work time is cut in half on concrete siphon project

Two bulldozers excavate trench for 8-foot 8-inch facility; work methods help place reinforcement and move forms swiftly



**McKISSICK
PRODUCTS
CORPORATION**
Box 2496 - Tulsa, Oklahoma



Scottie McBlock's a believer in "bein' prepared for meet any situation."

McKISSICK CONSTRUCTION BLOCKS

Designed to meet your
specific needs . . .

1 to 10 SHEAVES

**GUARANTEED TO
CARRY RATED LOADS
UP TO 500 TONS
DIAMOND OR OVAL PATTERN**

**SHACKLES
HOOKS
SPECIAL CONNECTIONS
CUSTOM DESIGNED BLOCKS**

Alloy flame hardened steel sheaves.

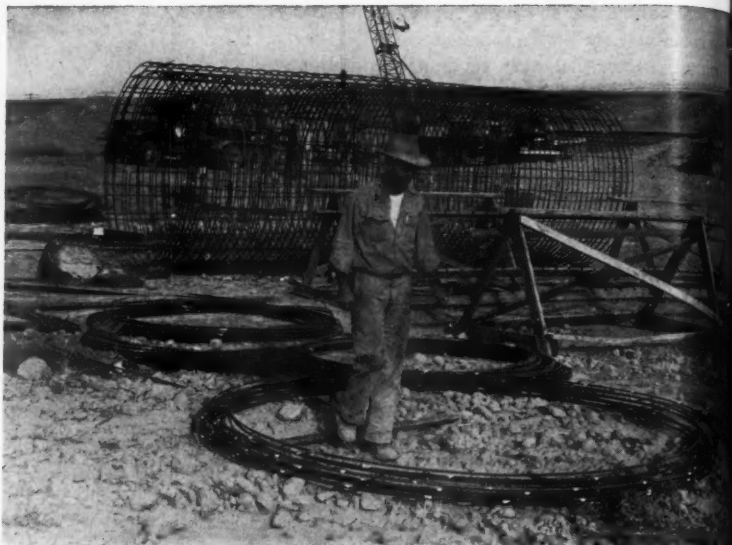
Extra large center pins and bearing assemblies.

Extra weight and balance.

McKISSICK BUILDS A BETTER BLOCK FOR EVERY PURPOSE

McKISSICK

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Some of the steel reinforcing that will form the backbone of steel cages is examined by Forrest Tennant, superintendent for Henly Construction Co. A completed cage is in the background. (Additional photos on facing page.)

With only 42 per cent of its working time used up, Henly Construction Co., Yakima, Wash., had its \$600,000 job on a concrete siphon near Ephrata in the Columbia Basin 85 per cent complete as of last September. Though the U. S. Bureau of Reclamation project was scheduled to last until the latter part of this year, it was completely finished before the start of 1956.

Credit for halving construction time on the siphon goes to a novel use of bulldozers for doing most of the excavation, to a method of placing reinforcing steel as a unit in a thin-walled siphon barrel, and to a procedure involving the moving and assembly of three sets of siphon forms daily with only three carpenters and two laborers.

The siphon is designed to take irrigation water from West Canal of the USBR's Columbia Basin project

near Ephrata, and carry it out toward thirty acres in Block 89, between Ephrata and Moses Lake, Wash. Henly's job included an inlet structure at West Canal, an outlet structure at the block of irrigated land, minor vent structures along the siphon, 7,800 feet of 8-foot 8-inch reinforced-concrete siphon, and 600 feet of concrete-lined canal.

The walls of the siphon are 9, 10, and 12 inches thick. The 10-inch thickness is more common; 12-inch-thick walls are located where 75 feet of the siphon cross the main line of the Great Northern Railroad. A double siphon was laid here so that there will be no further displacement of the railroad track when the present line is doubled sometime in the future.

Dozers excavate ditch

Excavation for the canal and siphon
(Continued on page 44)

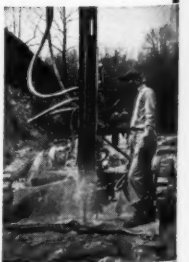
All-in-One "600" ROK-BITS



...offer rock drillers **NEW economy**

Massachusetts Turnpike contractors report rock drilling operations speeded up, at lower cost, with "600" Series Rok-Bits® on the job. The 3½-, 3-, 2¾-, and 2½-inch "X" design bits completely eliminate the rifling problem. Where ground conditions are suitable, we also offer the 2¾- and 3-inch bits in cross type. These bits fit directly on G-D extension rods, with no need for expensive adapters. You, too, can be sure of lowest drilling cost by using Brunner & Lay Rok-Bits and drill steel. Order today from our nearest plant. Request Bulletin B-1.

Gardner-Denver "Air-Trac" ▶

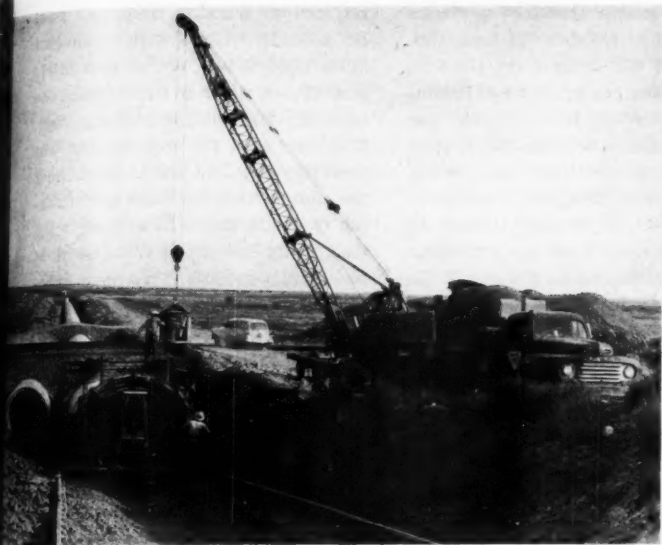


Brunner & Lay Products

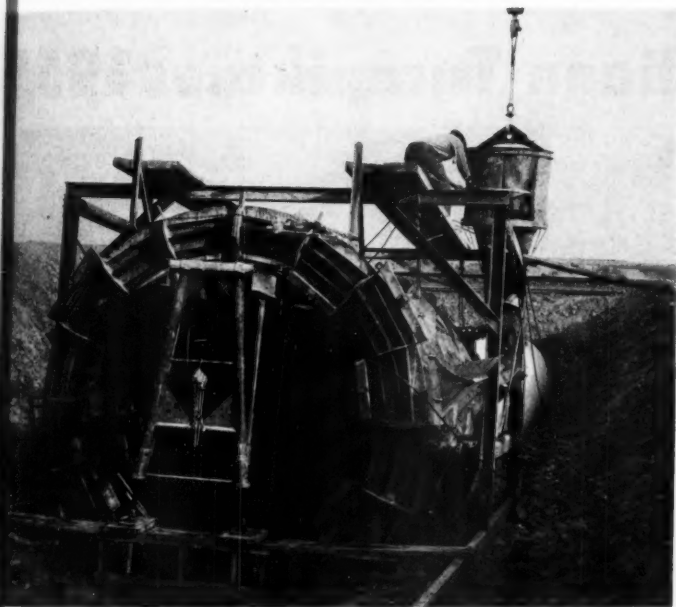
Brunner & Lay, Inc. 9300 King St. Franklin Park, Ill.	Brunner & Lay Rock Bit of Philadelphia, Inc. 2514 E. Cumberland St. Philadelphia 25, Pa.	Brunner & Lay of Los Angeles, Inc. 2425 East 37th St. Los Angeles 58, Calif.
Brunner & Lay, Inc. 150 Leslie St., Dallas, Texas	Brunner & Lay Rock Bit of Asheville, Inc. Sweeten Creek Road, Asheville, N.C.	Brunner & Lay of Portland, Inc. 660 N. Tillamook St., Portland 12, Ore.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 232

CONTRACTORS AND ENGINEERS



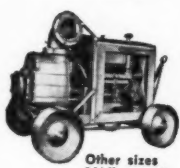
Concrete from a Ford-mounted Smith truck-mixer is swung to the forms by a P&H crane with Gar-Bro 1/2-yard bucket. Here, where the line intersects the Great Northern Railway, a double barrel was laid to avoid disturbing the tracks when the siphon is doubled.



In place for a pour, a 25-foot set of forms is tied down by screw-type jacks at both ends. During moves, the outside forms are supported on rails made with conventional Blaw-Knox concrete paving forms and inside forms on a needle-beam arrangement.



This Jaeger pumps all the water a 2" hose can handle



Other sizes 1 1/2" to 10"

Hi-performance Jaeger Model 2PN will actually pump all the water that can be pulled through a 2" suction line under average working conditions. Delivers 10,000 gph when operating at only 2400 to 2550 rpm (as much as 400 rpm below the speeds of similar ordinary pumps). Weighs only 160 lbs. on base, 190 lbs. on pneumatics. For complete information on this model or other Jaeger pumps, see your Jaeger distributor or send for Catalog P-4.

THE JAEGER MACHINE COMPANY

701 Dublin Avenue
Columbus 16, Ohio

LOADERS • COMPRESSORS • MIXERS • PAVING MACHINES
For more facts, use Reader-Reply Card opposite page 18 and circle No. 233

FEBRUARY, 1956

Konkure

Concrete Curing Compounds

For twenty years never a City, County, State or Federal test failure... There must be a reason!!

YOU PAY NO MORE FOR THE FINEST OF CONCRETE CURING COMPOUNDS

★ KONKURE NOW OFFERS:

- Clear—Black-Gray and White Pigmented-Resin Tilt-Up... Specified in Original Bureau of Reclamation Specifications.
- Concrete Sawing, Joint Filling and Curing Application for Airports, Highways, Commercial, Engineering Projects.
- Specify KONKURE... Specify the Cadillac of Concrete Curing Compounds.

★ OTHER KONKURE PRODUCTS...

- KONSET... A Hardener and Stabilizer for Topping and Bonding Old Concrete to New.
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- RUBBER WATER STOPS... PARA-PLASTIC Joint Sealer, Regular and Para-Plastic JFR.
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 234

"...Our Radio System Paid for itself on this one Job Alone!"

—Says Al Lizza, President, Lizza & Sons, Inc.
Contractors for Garden State Parkway



Trucks operating on parkway construction are under radio control at all times.

"With our operations extending over 22 miles of the Garden State Parkway, I can pick up the mike and talk to any man on the job. If any of the rigs break down, we get a service truck out on the road in a few minutes. Operations at the plant can be quickly adjusted, too, so that our fleet of hot-mix doesn't pile up at the 'down' machine."

Lizza & Sons has mobile units in the superintendent's car, master mechanic's and foremen's trucks, and other units on the lube trucks, two of the graders and five of the pickups. A control station at the asphalt plant keeps a dispatcher in touch with trucks at all times. Radio has earned hundreds of dollars a month in time saved by quick intercommunication between personnel. "It's likely our radio system paid for itself on this one job," adds Mr. Lizza.

Savings on the job mean increased profits. You'll find out, too, that actually radio costs you very little because it's self-amortizing.



(Top) Al Lizza at mike in field office talks to service trucks on road; and (above) Wally Slawson, Superintendent, trouble shoots operations from his car.

GET THE BEST—GET RCA 2-WAY RADIO! Quality that only the leader in radio and electronics can offer gives assurance of top performance under the most grueling conditions. Simplest maintenance and operating requirements. The RCA Service Company provides installation and service to keep your equipment operating at its best.

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- ☐ Send information on RCA 2-Way Radio for Construction.
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RADIO CORPORATION of AMERICA
COMMUNICATIONS EQUIPMENT
CAMDEN, N. J.

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 235

(Continued from page 42)

phon, amounting to about 80,000 cubic yards, included gravel, cemented conglomerate, and some large boulders. The small amount of rock present was drilled and shot, an Ingersoll-Rand 315-cfm compressor, two Ingersoll-Rand wagon drills, and Carset bits 2½ inches in diameter putting down the necessary holes. Holes were on 6-foot staggered centers, deep enough to make a clean break about 6 inches below grade lines.

In cemented formations that responded to heavy ripping, a LeTourneau K-30 roter was used behind a Caterpillar D8 tractor to eliminate drilling and shooting.

Unique on a job of this size was the use of two bulldozers to move approximately 95 per cent of the excavated material. General superintendent Forrest Tennant of the construction company had a Caterpillar D8 with a U-shaped type bulldozer excavate the canal and the ditch for the siphon by shoving material from the ditch bottom up a ramp. Dirt deposited near the top of the ramp was shoved to a spoil pile by another Cat dozer, this one with a straight blade. The entire siphon had to be backfilled. During the final stages of work, the finish grading was done on the spoil pile to form a smooth road. The machine working on the berm also scooped out a rough surface block of the ditch, sometimes with the help of the U-dozer. Though these preliminary passes only roughed out the trench, they removed a large percentage of the dirt. The up-ramp type of excavation done by the U-dozer then finished out the ditch, leaving neat sides. The ramp was maintained until excavation was complete.

Rapid excavation was in order where the siphon intercepts the main line of the Great Northern Railway. A temporary shoofly for the railroad was built and excavation and concrete work done so rapidly that trains were running again on the permanent location only 30 days after dozers had opened up the siphon ditch. Part of the credit for this speedy work goes to the small P&H ¼-yard dragline that helped the Cats muck out the excavation. The same P&H machine was used as a crane to place concrete.

Placing forms

The speed of concrete work was due largely to the forms, a good organization, and dependable material deliveries. Three shop-built sets of steel forms, each set 25-feet long, were used. The forms consisted of inner and outer steel shells, fabricated from 3/16-inch skin plate, well braced with steel ribs and steel wales. Each set had six sets of concrete placing doors at the spring line of the siphon. These fastened shut after concrete had been placed to their level, and the remaining concrete was placed from the top of the form.

The steel outside forms were carried on a railroad formed by two lines of conventional Blaw-Knox 9-inch concrete-paving forms. These carried each steel section on steel wheels,

which were mounted under the form framework.

The steel inside forms were supported on a needle-beam arrangement when they were moved. Screw-type jacks at the ends of the form predetermined exact alignment. The center 4 feet of the invert section remained open to avoid the formation of rock pockets when concrete was placed. Concrete placed through the spring-line doors moved down to this center point and was finished off by hand.

A time-saving schedule kept concrete operations moving swiftly. At 5 a.m., half the carpenter crew started work, loosening the siphon form nearest the end of the previous day's run. At 6 a.m., the rest of the crew showed up for work and began moving the

form one length ahead so it was in position for another 25-foot run. While this was being done, the first half of the carpenter crew was loosening the second form, which was moved ahead while the third form was being loosened. The three sets of 25-foot forms permitted 75 feet of siphon to be poured daily, though the sections poured were not adjoining.

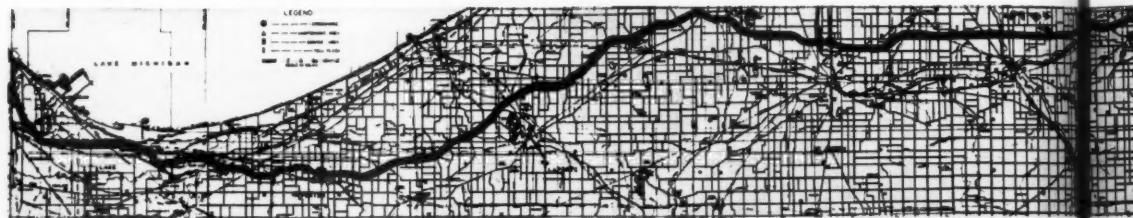
A steel bulkhead on the end of the construction joint retained the concrete, and it was slotted to receive a 9-inch rubber waterstop, as called for by plans and specifications.

Another construction trick with reinforcing steel, to insure that carpenters could work without delay, involved the use of a steel jig, built to the precise dimension of the ring of steel reinforcement in the siphon bar-

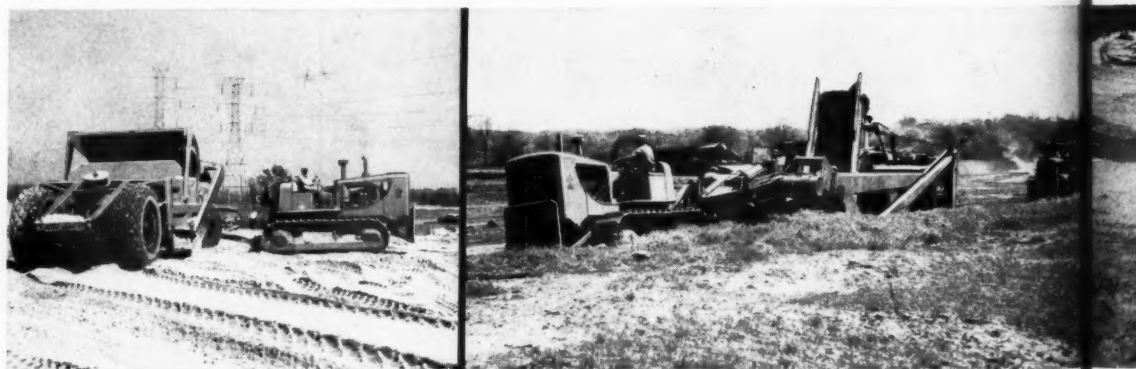
rel section. Working from this steel jig, a welder with Lincoln equipment built rigid 2-bar round concentric steel circles, which in turn formed the basis for the steel reinforcing cage. The steel cage for each section was then prefabricated on the bank near the siphon. This was done by arranging the rigid pieces in a wooden jig, then tying the longitudinal steel at the correct spacing. Transverse bracing was also provided so that there would be no longitudinal collapse of the steel cage during handling. With the help of cable slings and a pipe-pickup device, these steel mandrels were set in position in the ditch by the P&H crane.

When the concrete forms were moved ahead, they simply moved into the steel cage and were centered with-

The Indiana Turnpike... 1954



from the Illinois line to the Ohio line



used ALLIS-CHALMERS equipment to



More and more contractors, on all types of construction jobs, are taking full advantage of Allis-Chalmers equipment to bring new efficiency and economy to their production schedules. See your Allis-Chalmers dealer now . . . for the facts about *advanced basic design* and how it can help you do more work at lower cost.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

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The time allowed to get the three sets of steel forms in position, checked, and tied down, usually ran from the start of the work day until about 10 a.m. Then concrete placing began, continuing until the three sections had been filled.

The concrete-placing crew was about as small as the carpenter gang, consisting of only five men—two vibrator men, two finishers, and a dump man. Protex air-entraining agent increased the workability of the concrete, all of which was delivered to the job in Smith and Jaeger truck mixers by Empire Concrete Products, Inc., Ephrata. Mixers dumped fresh concrete into a pair of Gar-Bro ½-yard concrete buckets equipped with rubber elephant trunks for plac-

ing the material directly into the steel forms. All vibration was provided by Viber electric machines of the internal type.

Concrete was dumped into the spring line doors on the first pass. As it worked down to the invert and footings, the concrete was vibrated through the doors on either side. A vibrator was also handled inside the forms so that a good dispersion of mix was obtained in the critical floor points. Concrete was worked along neatly over the 25-foot distance—or less, depending on the weather—until at least the beginning of initial set had been developed in the invert section. Placing was then resumed from the top and material built up to full height.

All field contract operations were

under the general supervision of Forrest Tennant, general superintendent for Henly Construction Co. Robert Lzicar was project manager; Ed Wesfall, concrete foreman; C. E. Gemlin, carpenter foreman; and Norval Carl, master mechanic.

Field operations for the USBR were under the Quincy, Wash., construction office, headed by W. W. Ketchen, construction engineer. The chief inspector on the job was Ralph E. Houtrouw.

THE END

Construction trailers

■ A folder showing the various types of Fruehauf trailers suitable for use in the construction industry is available from the Fruehauf Trailer Co. Carryalls, dump trailers, tanks for

bulk cement, as well as asphalt and steel platform models are covered in the brochure.

To obtain this literature write to the Fruehauf Trailer Co., 10940 Harper Ave., Detroit 32, Mich., or use the Request Card at page 18. Circle No. 134.

Road-shock dampers ease vibration on light trucks

■ Road shock dampers reported to give light trucks the steering safety and riding comfort of an expensive automobile have been developed by the GMC Truck & Coach Division. Scheduled for display at the Chicago Automobile Show, January 7 to 15th, the dampers smooth out road vibrations before they reach the frame.

The dampers are mounted behind the trucks' front wheels, and coun-



This photo shows one of GMC Truck & Coach Division's unique road-shock dampers mounted on the brake backing plate of a light truck's front wheel.

teract road jolts with "floating" weights that slide downward in metal cylinders when bumps are encountered. They also tend to keep the wheels in contact with the road surface.

In a series of road tests, it was found that trucks equipped with the dampers could turn corners and negotiate washboard roads easier than ordinary vehicles due to their road-hugging ability.

The road shock damper consists of an 11.8 x 4.4-inch metal cylinder containing a 12-pound steel weight sandwiched between two coil springs. The weight slides along a steel rod running the length of the cylinder.

Tension of the springs has been adjusted so that the vibration frequency (bounce) of the damper weight opposes the vibration frequency of the vehicles' front wheels.

When the wheels bounce into the air, the weight plunges downward in the cylinder, muting the upward gyrations of the wheels and deadening the vibration normally transmitted to the body of the vehicles.

An added benefit of this deadening effect, is that softer springs may be used on the vehicle for more riding comfort. For maximum benefit, a damper is mounted on the brake backing plate of both the vehicles' front wheels.

For further information write to the GMC Truck & Coach Division, General Motors Corp., 660 S. Boulevard East, Pontiac 11, Mich., or use the Request Card at page 18. Circle No. 140.

95 Equipment report

Whipline...leading contractors

ent to move BIG YARDAGE...FAST

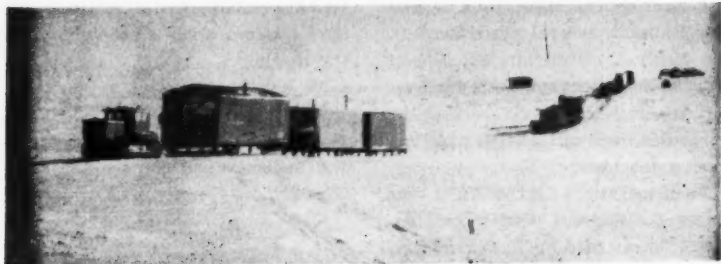


Contractors working on this great Indiana toll road used more than 200 Allis-Chalmers crawler tractors, motor scrapers and motor graders.

ALLIS-CHALMERS



For more facts, use Reader-Reply Card opposite page 18 and circle No. 236



Crawler tractors build base camps in Arctic

Building seven base camps for the DEW Line radar defense system on the Arctic rim in temperatures 20 degrees below zero and in gales of 30 miles per hour was the job facing B. M. Fitzpatrick, superintendent of one of the Caterpillar D8 trains operating from Barter Island, Alaska. Fitzpatrick had only one month before the ice would break up in which to transport 19 men, 45 sleds, and nine D8 tractors across 600 miles of sea and tundra.

Each unit of the train was made up of five sleds, one with a load of fuel, pulled by a Cat D8.

Fitzpatrick, traveling ahead of his crews followed a chart and used a ski-mounted Cessna 195 to scout for pressure cracks in the sea ice and a weasel ranging ten miles ahead of the train to scout the trail. Contact with the units was maintained by radio.

Knowing approximately where the sites were to be located, the crews chose what looked like a logical location in the site area and began their job.

An air strip was built out of snow by a crawler that circled the area, working the snow over the edge. In about three shifts, the D8 had built an air strip 200 feet wide and from 4,500 to 8,000 feet long. As soon as the strip was completed, C-124's and C-46's landed with more equipment and men to build the radar sites.

The entire train traveled for 17 days, stopping only five days on the road. Even though they were pulling five sleds, the D8's averaged more than 40 miles a day. Traveling on the ice-covered Arctic Ocean was smooth with the units moving in fifth gear at an average of five miles per hour.

Ice breakup constituted the only danger, and a special escape hatch in each tractor provided for the operator's safety in case of accident. The D8's were stopped only three times a month for servicing. The two machines that had worked the full distance had 375 and 357 hours, respectively, to their credit when the job was done.

Flagman's code

■ LeTourneau-Westinghouse Co., offers a 9x12-inch photograph reproduction of the flagman's code for posting at job sites. Pictures show the flagman the proper signals to use on road-construction work.

To obtain this chart write to LeTourneau-Westinghouse Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 56.

Bulletin on proceedings of short course on water

A bulletin entitled "Proceedings of the Eighteenth Annual Short Course for Water and Sewerage Plant Superintendents and Operators" has been released by the Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

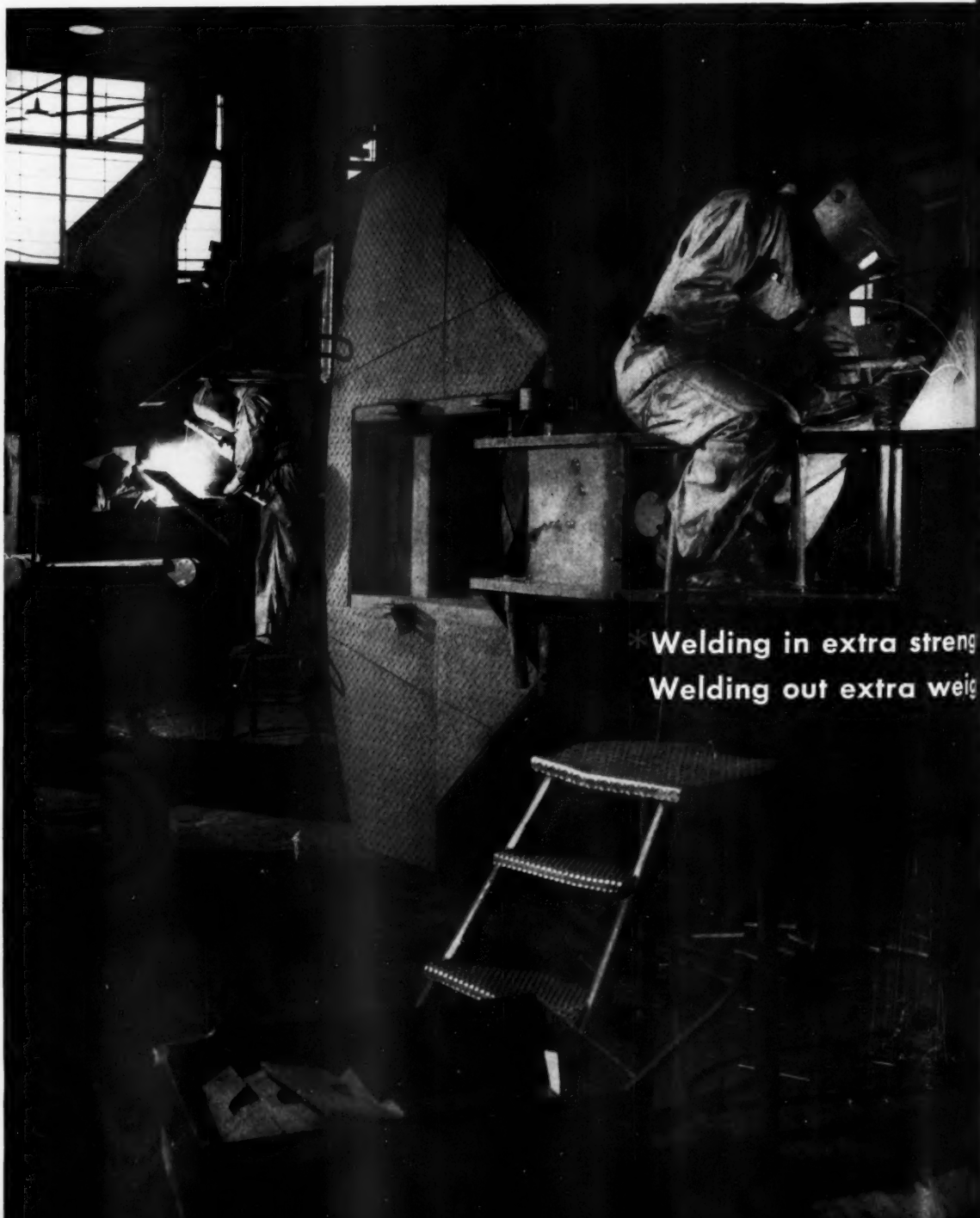
The work, Bulletin No. 53, includes the papers that were given at the meeting, covering such topics as the use of the slide rule, well-drilling contracts for small municipalities, extensions to water-distribution systems, and many others.

The book may be obtained from the Engineering Experiment Station, College of Engineering, Louisiana State University, and Agricultural and Mechanical College, Baton Rouge, La.

Fulton Mills promotes

Peter H. Walmsley has been appointed assistant manager of the New Orleans office of Fulton Bag & Cotton Mills, New Orleans, La., maker of tarpaulin, canvas, tents, and burlap. With the firm since 1949, Walmsley was connected with manufacturing operations and more recently he was in the general sales office.

what puts more guts in Pa



* Welding in extra strength
Welding out extra weight

Underbody attachment for light scarifying

■ A new underbody scarifier for use with Seaman Trav-L-Plants and Pulvi-Mixers has been announced by Seaman-Andwall Corp.

The new attachment has six heavy-duty teeth and a header board or curb shoe for light scarifying in combination with in-place mixing. Easily bolted midway between the front and rear wheels of the Seaman Pulvi-Mixer or Trav-L-Plant, the scarifier is hydraulically controlled from the operator's station.

For further information write to

This new scarifier attachment mounts on Seaman Trav-L-Plants and Pulvi-Mixers for light scarifying in combination with in-place mixing.



Seaman-Andwall Corp., 282 N. 25th St., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 82.

Batter-block machine

■ New literature available to concrete-block producers and contractors describes a new way to make batter block for catch basins and manholes. Now these odd shaped units are made on the same machines and at the same speed as regular building block.

The new Besser Vibrapac machine includes a sliding insert in the mold which moves 3 inches to one side, permitting the block to be stripped at an angle.

The manufacturer points out that before this novel idea was put to work, batter block was generally made by hand machines. This was a slow, costly process and retarded the use of concrete block for manholes and catch-basin construction. Batter block made on the Automatic Vibrapac, it is emphasized, are accurate in dimensions and shape.

To obtain this literature write to Besser Co., 3400 Jesse Blvd., Alpena, Mich., or use the Request Card at page 18. Circle No. 138.

Handy plan holder has slide-over clips

■ A new expandable device for holding plans is available from the Plan Hold Division of Air Comfort Co., South Gate, Calif. Brackets pivoted within a wall plate support Plan Holds



equipped with special slide-over clips. The brackets swing back and forth making plans easily accessible. Skirted plans can be filed easily.

A rolling stand with a built-in wall plate is also available, providing a convenient support for the brackets and Plan Holds.

For further information write to the company, or use the Request Card at page 18. Circle No. 122.

Ateco Division names new sales manager

William A. Bright, Jr., has been appointed sales manager of the Ateco Division of Greenville Steel Car Co., Greenville, Pa., manufacturer of earthmoving equipment for crawler tractors.

With the firm since 1942, Mr. Bright will be associated with George C. Brecht, the new sales manager.

P&H power shovels?

ALL-WELDED CONSTRUCTION

Engineers were first to discover that way to put more guts in excavating equipment was to throw out old-fashioned methods and replace them with modern materials and processes.

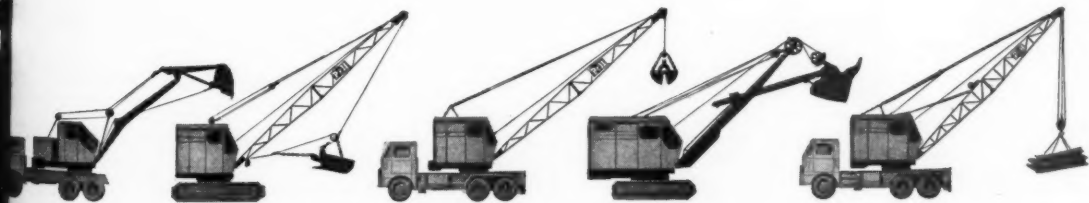
That meant welding in extra strength. Getting rid of useless weight.

Castings that added useless weight are replaced with weldments of new, high tensile steels and rolled sections. Brackets, stiffeners and reinforcing plates are added for extra strength. Welding these into one rigid unit is the way

P&H puts guts in every ounce of steel.

Years of actual service have proved the value of P&H modern engineering. Shovel users everywhere have demonstrated their acceptance by making P&H the largest manufacturer of power shovels and cranes in the business.

Your P&H dealer will be glad to point out, feature by feature, how P&H puts more guts in power cranes and shovels with all-welded construction. Also, in other ways. Harnischfeger Corporation, Milwaukee 46, Wisconsin.



For Modern Engineering, Look to

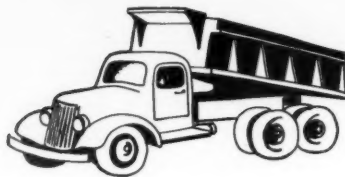
HARNISCHFEGER

POWER CRANE and SHOVEL DIVISION



For more facts, use Reader-Reply Card opposite page 18 and circle No. 257

Roads and highways: Job study



This is the eleventh in a series of articles consisting of excerpts from the 1,280-page book, "Moving the Earth", by Herbert L. Nichols, Jr., published in March of last year. Priced at \$15, the book is available through the Book Order Department of CONTRACTORS AND ENGINEERS, 470 Fourth Ave., New York 16, N. Y. A copy may be ordered on approval by circling No. 1 on the Request Card at page 18. Approval copies will be billed at \$15 plus postage.

BROS tip sheet

FLASH!

FULL TRAFFIC FLOW MAINTAINED ON BUSY TWIN CITY EXPRESS ROUTE DURING SEAL COATING OPERATIONS



On busy express routes the use of Bros Self-Propelled Rollers keeps the traffic moving.



On urban streets the turn around problem is eliminated with Bros Self-Propelled Rollers.

BROS SELF-PROPELLED ROLLERS DO THE TRICK; ALSO END ACCIDENT HAZARD OF ROLLER TURN-AROUNDS

Keeping vital traffic arteries in shape previously created bottle-necks, rerouting problems and accident hazards during maintenance operation. Now Bros Self-Propelled rollers with torque converter and reversing gear solve those problems and bring all the advantages of pneumatic tire rolling to seal coating jobs.

On the busy Belt Line that circles the Minneapolis-St. Paul metropolitan area, heavy traffic continued to roll right along side two Bros 7-ton Self-Propelled units during seal coating of 7.6 miles of pavement.

The job engineers report that traffic and work flow were maintained *only* because the Bros rollers with reversing gears required no turn-arounds.

Rolling was done in 2 passes. Each of two 9' and one 11' strips were completely covered by the two rollers in a single pass.

This straight-line rolling keeps work moving right along with the spreader unit, saving time and money. And no tearing up of freshly laid tar and chips at turn-around points occurs.

Smoother starts, fast reversing, easy steering, visibility all around were among other important advantages of the SP-54s on this job. Read more about these features below!

SP-54 — THE FIRST ALL REAR WHEEL DRIVE ROLLER WITH FULL OSCILLATION OF WHEEL PAIRS

Tractive effort is maximized by positive chain drive to all rear wheels. No dead wheel to get the roller "hung up" or cause skidmarks. Only the SP-54 with full oscillation of all wheel pairs provides even wheel loads and uniform compaction densities. One-half inch overlap of wideface front and rear tires provides full 100 percent surface coverage.

TORQUE CONVERTER PROVIDES SMOOTHER STARTS

Torque converter drive provides smooth, even flow of power to the drive line... smoother starts when reversing directions, and prevents tearing up freshly laid surfaces. Provides an infinite range of operating speeds in both forward and reverse.

SHUTTLE GEAR AND 3-SPEED TRANSMISSION SAVES TIME

A shuttle gear and 3-speed transmission provides the same speeds in reverse as in forward range. Fast shuttle or reversing gear saves time by eliminating shifting through the transmission when changing direction.

DOUBLE BRAKING

Hydraulic brakes on both rear wheel pairs can be operated separately. When braking one pair, drive power is transferred to the other pair thus preventing the roller from being "hung up" where traction is difficult.

EASY HANDLING BY HYDRAULIC STEERING

Uniform or constant speed hydraulic steering provides smooth, sure control at all engine and roller operating speeds. Turns easy and fast in 18 ft. radius.

WHERE CONDITIONS PERMIT, TOW A ROLLER FOR FASTER RESULTS



On school grounds, parking lots and other areas where turn arounds are possible, you can tow a roller with the SP-54 and get results twice as fast.

The SP-54 is powered by a 50-HP engine. A towing hitch on rear of the body. Get complete information on the SP-54 — the best roller for mat surfacing, seal coating and standard lift compaction jobs. Write: Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave. S.E., Minneapolis 14, Minnesota.

Road construction may involve clearing vegetation; stripping and storing of topsoil; excavating soil and rock to cut natural levels to road grades; hauling the spoil to road fills or waste dumps; building culverts, bridges, and drainage systems; raising low areas to road grade by fill obtained from highway cuts or borrow pits; finishing, topsoiling, and seeding of slopes; and cleaning up the work area.

Usually, this work must be accomplished within a time limit. It is desirable to get the maximum number of machines and men on the job as soon as possible after the start, but it is more important to keep them efficiently employed once they are there.

When time permits, it is often desirable to perform complete operations in sequence. If an entire work area is to be cleared, it will usually be easier to arrange dirt-moving sequences than to have the excavators limited to a few small sections. Culvert construction should be completed before fills are raised high enough to go over them, unless they are to be installed by ditching the completed subgrade.

Liberal areas of rock should be cleaned before drilling starts. Pioneer bulldozer work should be well advanced before scrapers operate.

If the schedule is close, delay in one operation will delay others that have to wait for it, which may be more costly in machine and man-hours. These secondary delays are much more serious when a maximum amount of equipment is crammed into a job than when a few units are doing it over a longer period.

Basic factors

Basic factors to be considered in figuring grading for a road may include:

1. Clearing costs.
2. Topsoil stripping, storage, reclamation, spreading, and planting.
3. Amount and type of soil excavation in cuts or borrow pits.
4. Amount and type of rock excavation.
5. Availability of suitable borrow and cost of purchase.
6. Haul-road construction and maintenance, and length of hauls.
7. Quality of fill required, and processing required of material from cuts and pits.
8. Fill compaction, shrinkage, and disposal of surplus.
9. Slope finishing and protection.
10. Ground-water conditions and drainage requirements.
11. Structures such as bridges, culverts, and retaining walls.
12. Possession or availability of proper machinery, with necessary parts and supplies; extra costs of using second-choice or

CONTRACTORS AND ENGINEERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 238

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beat-up equipment.

13. Availability of construction supplies such as pipe and forms.
14. Labor supply.
15. Weather—rain, snow, ice, dust, frozen ground, frozen equipment, mud.
16. Time of completion of related structures, such as bridges, being built under separate contract.

In highway work the amount, kind, and location of cut, borrow, and fill, as well as the length of haul, may be specified. Haul may be described as "normal" or free, up to a certain distance, which may be 300 to 1,000 feet, and longer hauls called "over-haul." Excavation may be described as "unclassified," or divided into rock yards and dirt yards.

In less formal jobs, these factors may be indicated only approximately, or may be figured by the contractor from grade or route plans.

Where cuts and fills are shallow, and side slopes lacking or moderate, grading can often be estimated fairly accurately by inspection of center-line stakes. The exact yardage is sometimes not of primary importance, as stripping topsoil and working over a piece of ground represents an amount of machine time that may be only moderately increased by the cuts and fills.

Several errors must be watched for, however. Cuts and fills on the stakes may be figured from the top of the stake, from ground level, or from a line on the stake. The grade indicated may be subgrade, in which case it is taken at face value, or finish grade, when the depth of base courses and of surfacing must be added to the cuts and subtracted from the fills. The width to be figured on is not only the road and shoulders, but also gutters and slopes. The depth of topsoil to be stripped is subtracted from the cuts, added to the fills, and is considered separately as an important cost factor.

When cuts or fills are deep, side slopes exist, topsoil need not be stripped, or the job is a large one, yardages should be carefully calculated. If this is not done on the plans, the contractor can do it for himself.

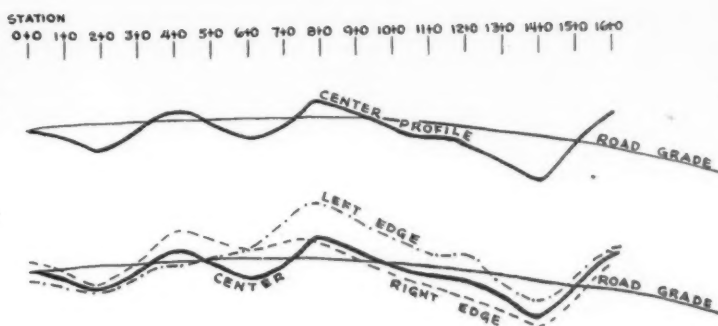
Yardage calculation

The minimum staking for a road is the center line. When this is done, a profile is taken, showing the elevation of the ground at each stake. These elevations are plotted on cross-section paper, usually with the vertical scale ten times the horizontal, and the points connected by a line. A profile for the road is then sketched in according to the standards of grade and vertical curve required, or from some previously formed plan. This line should represent the subgrade

(Continued on next page)

For more facts, circle No. 239→

Superimposed on the final road grade are center and side profiles of the existing road grade. Cuts and fills are shown above and below the line of the proposed road grade, respectively.



SHOPPING CENTER TEXAS STYLE... **BIG**



GULFGATE SHOPPING CITY, Houston, Texas. Architect: John Graham and Company, Seattle. Contractor: Farnsworth and Chambers.



840,000 SQUARE FEET OF SPACE!

Gulfgate Shopping City near Houston, established by Allied Stores Corp., is like most things in Texas . . . big. The \$20,000,000 project will house 90 to 100 stores, including Joske's department store with 207,000 square feet of space. Overall, there are 840,000 square feet, facilities to park 20,000 automobiles a day. Fabricated steel for this gigantic, modern development was furnished by Ingalls.

**FABRICATING
STEEL
IS OUR
BUSINESS!**



**IRON WORKS COMPANY
BIRMINGHAM, ALABAMA**

Sales Offices:
New York, Chicago, Pittsburgh, Houston, Atlanta, New Orleans

Plants:
Birmingham, Ala.; Verona, Pa.; Pascagoula, Miss.;
North Birmingham, Ala.; Decatur, Ala.

(Continued from preceding page)

before the addition of any imported material.

Distances measured from the road line to the ground line will indicate the depths of cut and fill required to establish the road grade. If topsoil is to be stripped, its depth should be added to the fills and subtracted from the cuts.

If the ground does not slope across the line of the road, this type of profile should give a reasonably accurate picture of the relative volume of cuts and fills, and the distances they are to be moved. However, to obtain yardages, cross sections usually must be calculated.

If the road is laid out on side hills, side stakes and slope stakes may be

set. The side stakes may be at the edge of the pavement, at the outer edge of the shoulder, or the far side of the gutter, if any. In general, the shoulder or the gutter locations are preferable. Slope stakes are placed where the intended cut in a bank reaches its top, or at the outer, base edge of a proposed fill. These are not placed until cross sections are calculated.

If the side stake elevations are plotted in the same manner as the center line, two additional profiles can be drawn. These will give additional information about the bulk of material to be moved, but since they often do not include cuts for gutters, and cannot show the volume which must be dug or filled for side slopes outside the road lines, they are not

an adequate basis for careful calculation.

A cross section is a profile taken at right angles to the line of the road. It is at least long enough to include the full width that will be graded. Such profiles are sometimes taken with hand or string levels. They may be taken at each 100-foot station, and at points where the ground surface changes, or, in smooth terrain, less frequently.

This cross profile is also drawn on cross-section paper, preferably on the same vertical scale as the center profile. Horizontal scale may be the same as vertical, or at any convenient proportion to it. The cross section of the road subgrade is drawn in.

Wherever the ground line is above the road line, there will be a cut;

and where the road line is higher than the ground line, there will be a fill. If topsoil is to be stripped and saved, it may be well to lower the ground line by the depth of the topsoil to save confusion.

The most convenient way to measure the areas of cut and fill is by counting squares and fractions of squares. If a lot of work is to be done, areas can be measured by means of a planimeter.

Fill shrinkage

When fills are rolled to the compaction required in modern highways, the material is often compressed into a smaller space than it occupied in the bank. This shrinkage should be allowed for in figuring cross sections. Loam soils often shrink 10 per cent; clean sand, 5 per cent or less. Blasted rock, not mixed with other dirt, will show a minus shrinkage, or swell.

Compaction by hauling equipment without rolling is variable and will seldom cause shrinkage.

On side hills, one station is likely to include both cut and fill. The smaller amount is subtracted from the larger, giving net cut or net corrected fill.

The net square yards of the cross section are converted into cubic yards by multiplying by the length of the road it represents. If sections are taken at 100-foot intervals, each will represent a piece 100 feet long—that is, halfway to the next section, on each side.

When the 100-foot interval is used, it represents 33 1/3 yards. It is easier to multiply the section square yards by 100 and then divide by 3, than to multiply by 33 1/3.

The net cut and net fill figures, when converted to cubic yards, are used in making a mass profile. The gross cut figures are converted to cubic yards, in the same manner, to determine the total excavation, exclusive of topsoil.

Topsoil volume is figured by multiplying the length of the road, the average width to be stripped as indicated by the cross sections, and the average depth.

Cubic yards of net cut are added together and compared with the total of net fill yards to determine whether extra fill will have to be obtained from pits, or whether fill will have to be wasted outside the road area.

A mass profile is prepared by drawing on cross-section paper a straight line to indicate the road grade, dividing it into stations, and posting cubic yards of net cut above it and net corrected fill below it, on any convenient scale. It is sometimes helpful to draw in blocks representing the fill at each station.

A curved line, the mass profile, is drawn connecting the station points. The amount of net cut or net fill at any point along the road can now be scaled off, as well as the haul distance between cuts and fills.

The haul distance is measured between the centers of mass, or centers of gravity, of the cut and fill. The longer and shorter hauls should average out.

(To be continued next month)

CONTRACTORS AND ENGINEERS

HOW TO REPLACE A HYATT BEARING

by HY WHEELER, the sage of the socket wrench

The big thing to remember, brother, is to *always* replace a HYATT with *another* HYATT of the same type and size. You know why? Because HYATTS are so precision-built they're *completely interchangeable*. You don't have to change the shaft or bore diameter a bit. This saves you trouble and keeps the boss happy, too, by making sure he gets his money's worth!

When you're ordering a replacement HYATT, just be *sure* to get the right one, either from the parts list put out by machine builders, or put down on your order all the markings from all the bearing parts.



And when the new bearing comes, be sure it's in this familiar blue and yellow box. When it comes to quality,

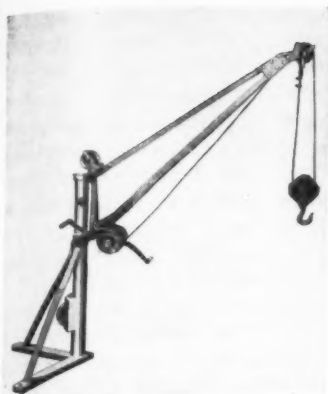
there's no
substitute for . . .
HYATT

STRAIGHT ☐ BARREL ☐ TAPER ☐

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

For more facts, use Reader-Reply Card opposite page 18 and circle No. 240

ROLLER BEARINGS



The Club 1,000-pound-capacity derrick, one of two new King Mfg. Co. models.

Contractor's derricks set up, transport easily

■ A line of contractor's and builder's derricks announced by King Mfg. Corp. features ease of transporting, erecting, and operating. The boom slips off the mast for transporting, and the legs and mast can be folded.

In use, the boom swings in a 360-degree circle. The unit is equipped with hand hoist and 6-inch bronze bushed sheave in the mast for use with a King gasoline or electric power hoist.

The derricks are available in two models, the Club, with 1,000-pound capacity, and the Diamond, with 1,500-pound capacity. The Club is 7½ feet high and has a 4-foot 6-inch boom; the Diamond is 8 feet high and also has a 4-foot 6-inch boom. Both have load and boom swing brakes.

According to the manufacturer, these units will hoist loaded wheelbarrows and a variety of building materials.

For further information write to King Mfg. Corp., 3146 W. Chicago Ave., Chicago 22, Ill., or use the Request Card at page 18. Circle No. 32.

New fastening tool uses two size studs

■ A new Ramset stud fastener, the Duo-Jobmaster, can be used with either a ¾ or a ½-inch stud with only a simple change of the barrel. This makes it possible for a single tool to do 90 per cent of the usual fastening jobs in construction. The change of barrels can be made on the job.

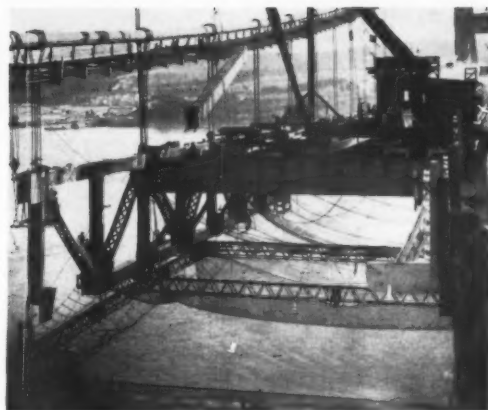
For further information write to Ramset Fastening System, Winchester-Western Division of Olin Mathieson Chemical Corp., 12117 Berea Road, Cleveland, Ohio, or use the Request Card at page 18. Circle No. 136.

Steel joists

■ A bulletin from Joseph T. Ryerson & Son, Inc., describes and gives the properties, linear loads, and advantages of lightweight open-web steel joists for floor and roof supports. Design and installation data, and illustrations of accessories are included.

To obtain this catalog write to Joseph T. Ryerson & Son, Inc., P. O. Box 8000-A, Chicago 80, Ill., or use the Request Card at page 18. Circle No. 63.

NEWLY DESIGNED LIFE NETS with safety L & S section clamps are now offered by E. D. Bullard Co. Shown here in use on a bridge-construction job, the nets are fabricated of ¾-inch-diameter extra-superior pure manila rope with a breaking strength of 1,350 pounds. Water-repellent and mildew-proof, the nets are made to individual specifications. L & S clamps strengthen the net and make every junction fireproof and waterproof, besides keeping the net from curling and knotting. For further information write to the E. D. Bullard Co., 275 Eighth St., San Francisco 3, Calif., or use the Request Card at page 18. Circle No. 112



Select Earth Compaction Equipment Wisely

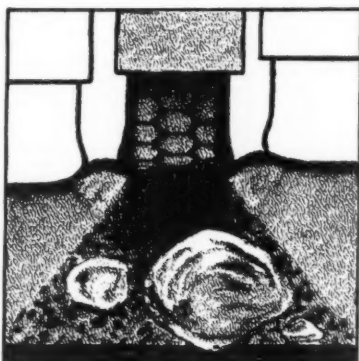
The right equipment assures a job well done at low cost.

Nothing is more important in compacting an earth fill than the proper selection of equipment well chosen; the right equipment produces modern density requirements of the engineer at relatively low cost to the contractor. In a few jobs, it is true, the earth can be used uncompacted. In others, the sheepfoot roller has a definite place; however, on the highest-type fills, the heavy duty rubber-tired compaction roller has demonstrated its outstanding ability to densify heavier lifts with fewer passes than any other equipment. In fact, the development of pneumatic rolling in the past 12 years has made it possible to build fills faster and far better than ever before.

That is why, in our mind, the heavy rubber-tired pneumatic compaction roller represents the greatest contribution to soil compaction in recent years. In 1932, contractors began to notice that loaded scrapers, far heavier than the "sheepfoot tamps" then in use, delivered high compaction in the area under the tires. The modern pneumatic compactor sprang from this basic observation.

COMPARING METHODS

The first direct comparison between the two types of rolling was made at Isabella Dam, Calif.: 42,000-pound



Southwest Rollers compact lifts 24" thick permitting rocks, cobbles to be incorporated in fill without removal.

sheepfoot rollers were used on the first dirt contract; pneumatics with 20,000 pounds of weight per wheel and 80 psi tire pressure on the second job. Twelve sheepfoot roller passes were made on 12-inch lifts on the first job. On the second contract, a Southwest C-50 Compactor made 6 passes on 18-inch lifts. In both cases, 70% of



Fill compaction achieved by sheepfoot roller and Southwest compaction roller. The substructure is 975 feet long and 95 feet from bedrock.

the tests went over 94% of Modified AASHO density. On this job, incidentally, a Southwest Giant Ripper was used for the first time to loosen and pre-wet the borrow pit.

Later, pneumatics also proved their ability where water was scarce—in dry desert sand on 2-inch lifts, they gave a fair degree of compaction under conditions considered almost impossible.

Because the Southwest Compaction Rollers generally will handle thicker lifts than a sheepfoot, rocks or cobbles can usually be incorporated into the fill without undergoing the expense of their removal. They will also compact a fill at a higher moisture content than a sheepfoot roller. The ponderous weight of their heavily loaded pneumatic tires overcomes pore pressures in the soil, squeezing some of the excess water up to the surface where it can evaporate. Furthermore, tests have shown that such a pneumatic-rolled fill has unusually good ability to shed rain water.

Engineers and construction authorities have concluded from tests that most earth-fills can be compacted by heavily loaded rubber-tired compaction rollers with about half the number of passes and for about half the cost of comparable results with the sheepfoot.

OBSELETE SPECIFICATIONS

The truth is that the superior performance of pneumatic rollers such as built by Southwest has made many specifications obsolete—specs which call for one roller for each 150 cubic yards of fill per hour hauled in. South-

west Compaction Rollers can handle considerably larger amounts.

For a really high-type compaction job, compaction equipment needs weight, and it should be adaptable to a wide range of tractors. If pneumatic, its wheels should deliver the same constant load pressure regardless of ground contour. It should have full-oscillating weight boxes, so that there is absolutely no bridging or shifting of load. Weight boxes and tire pressure should offer the utmost flexibility. Standard 4-section units should be built so that they can be quickly converted to 3, 5, or 6-unit rollers in a minimum of time.

The unit should be able to compact 12-inch lifts with the same ease that 6-inch lifts were compacted, preferably in from 4 to 6 passes, and at greater speed than has ever been possible before. The ever-increasing density and CBR requirements on 1956 model fills make it necessary to use the finest modern processing and compaction equipment to get a good job done swiftly, and at a profit.

WRITE TODAY!

For illustrated folders on the finest compaction roller equipment developed to date.

SOUTHWEST WELDING & MANUFACTURING CO.

Construction Machinery Division
ALHAMBRA, CALIFORNIA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 241

By contracting to purchase the entire output of the Reisser Corp. of Blair, Neb., LeTourneau-Westinghouse Co. of Peoria, Ill., has added the Elegrader to its already extensive line of earthmoving equipment.

Elevating grader gives high production

■ The Reisser Elegrader, an elevator attachment for motor graders that will handle up to 1,500 cubic yards of material hourly on side-casting assignments, is now available from LeTourneau-Westinghouse Co. Built for use with the Models 550, 610 and 660 motor graders made by the Adams division of the firm, as well as the Caterpillar No. 12 motor grader, the Elegrader makes the standard grader an all-purpose tool for loading, cast-



ing, terracing, widening, and strip-ping.

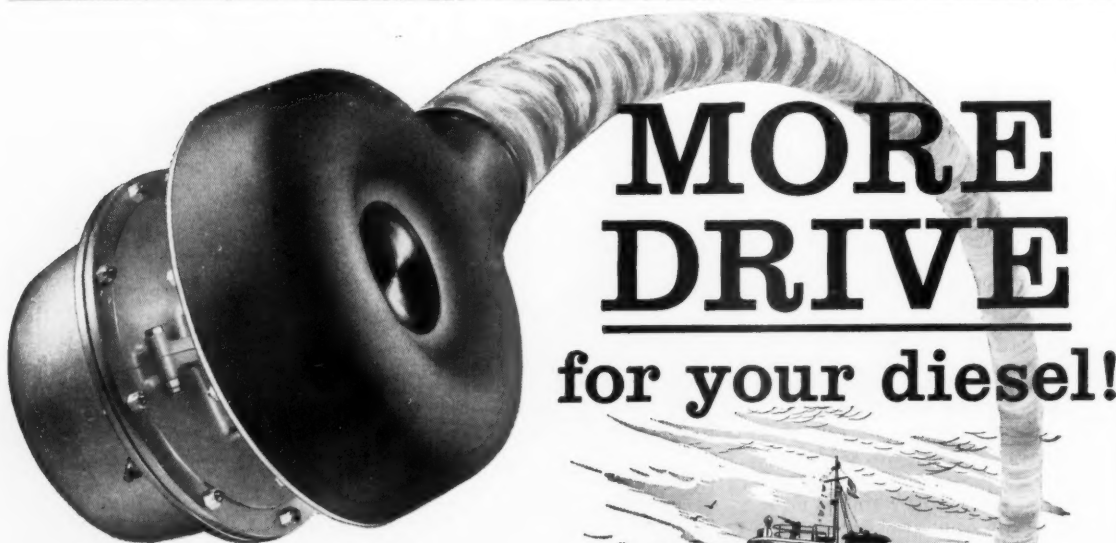
The conveyor comes in 16, 19, 22, and 27-foot lengths. The 22-foot-long Model is capable of loading

trucks at a rate of 12 yards per minute, and the 27-foot Elegrader betters this rate by 20 per cent. This greater production, according to the manufacturer, is attributable to the

unit's more efficient plowing action in getting material onto the conveyor belt, the 42-inch troughing belt conveyor that carries about 30 per cent more material than a flat belt of the same width, the more efficient use of the motor grader's horsepower, and a belt speed of 475 feet per minute. At this speed, material is delivered with an ejection effect, shooting clear of the end of the conveyor.

The Elegrader is versatile: any model can be converted into a 16, 19, 22, or 27-foot conveyor by adding or removing extensions. All but the 27-foot model are equipped with a mechanism that allows the carrier to be raised to a perpendicular position when the unit is being moved.

For further information write to LeTourneau-Westinghouse Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 102.

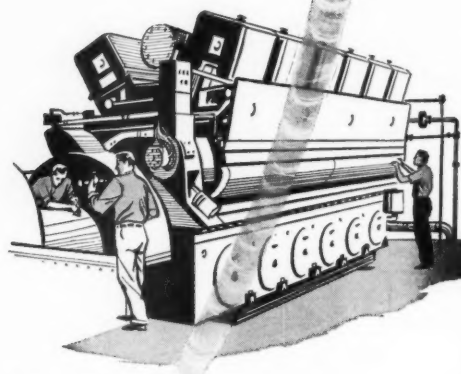


Here is how the application of AiResearch Turbochargers can affect the performance of your mobile or stationary diesel equipment:

- ★ Adds more power in relation to size and weight than any other units in this field.
- ★ Decreases fuel consumption. Besides decreasing costs, this factor greatly increases the non-refueling range for mobile equipment.
- ★ Provides power as needed by responding rapidly to acceleration requirements. This factor greatly decreases smoking.
- ★ Maintains sea-level power under all altitude conditions.
- ★ Greatly reduces the noise level of your equipment while eliminating power-wasting mufflers.

AiResearch is the largest producer of small turbomachinery in the United States. Twenty-five million hours of experience in deriving exceptional power from small units is the background for the development of the AiResearch Turbocharger. This power package was recently applied to Caterpillar diesel machinery with startlingly effective results.

Your inquiries are invited.



THE GARRETT CORPORATION
AiResearch Industrial Division

9225 Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY

For more facts, use Reader-Reply Card opposite page 18 and circle No. 242

High-capacity truck-crane meets road limits easily

■ The Model 43-MR truck-crane, a 35-ton rubber mounted unit capable of handling its maximum rated load at a 15-foot radius with a 40-foot boom and outriggers, has been announced by Marion Power Shovel Co., Marion, Ohio.

In addition to having the full power, operational flexibility, and positive air control of the crawler mounted 43-M announced earlier, the new model has dual front axles that provide good weight distribution for this rig.

A power removable counterweight prepares the machine for highway travel, and the crane's 180-inch wheelbase makes for greater maneuverability in traffic and on the job. The unit can turn in a 45-foot radius.

Booms up to 100 feet are available, though the maximum boom length recommended without outriggers is 70 feet. A maximum boom of 60 feet is recommended for clamshell operation.

For further information, write to the manufacturer, or use the Request Card at page 18. Circle No. 104.

Diamond blades

■ A mailing piece from Cardinal Engineering Corp. illustrates the firm's "King Size" diamond blade for wet cutting. Also shown are abrasive masonry blades, concrete-cutting blades, and Non-Brak masonry blades.

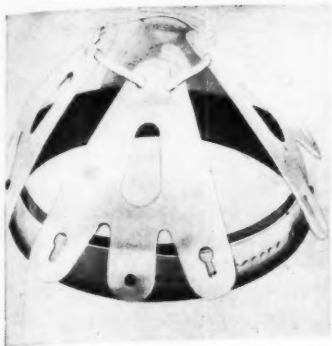
To obtain this mailing piece write to Cardinal Engineering Corp., 144 Burnside Ave., Philadelphia 27, Pa., or use the Request Card at page 18. Circle No. 3.

Surveying instruments

■ Engineers' transits and levels, builders' and contractors' instruments, and accessories for these units are pictured and described in a 16-page catalog from C. L. Berger & Sons, Inc. The code name and complete specifications of each instrument are given.

To obtain this catalog write to C. L. Berger & Sons, Inc., 37 Williams St., Boston 19, Mass., or use the Request Card at page 18. Circle No. 51.

CONTRACTORS AND ENGINEERS



The new Supergard safety hat has this full-floating completely adjustable headband.

Headband is feature of new safety hat

A new safety hat with a full-floating headband completely adjustable to head sizes from 6½ to 8 is announced by The Boyer-Campbell Co. Called Supergard, the hat is molded from a flame-retardant waterproof material in seven different permanent colors—red, yellow, blue, white, grey, green, and brown.

There is no lacing involved in the various head adjustments, each size setting being positive and secure. Adjustment difficulties which are said to sometimes occur with ordinary hats and caps of this type are eliminated in the Supergard.

The Supergard hat is also fitted with a new plastic cradle, giving a degree of hygiene never before accomplished in safety hats. No metal of any kind is used in the hat. Only the wrinkle-free sweatband, leather and leatherette, need be replaced when transferring the hat from one employee to another.

For further information write to The Boyer-Campbell Co., 6540 St. Antoine St., Detroit 2, Mich., or use the Request Card at page 18. Circle No. 81.

Oil filtration survey for equipment operators

A service for operators of construction equipment—a complete survey of filtration needs of trucks, earth-movers, stationary engines, and other filter-equipped engines—is offered free of charge by the Wix Corp., Gastonia, N. C., as an introduction to its Engineered Filtration Program.

The survey is done by a Wix-trained filter specialist, who checks equipment, notes vehicle number, make and type of vehicle or engine, oil-filter type, and the correct replacement cartridge for each filter.

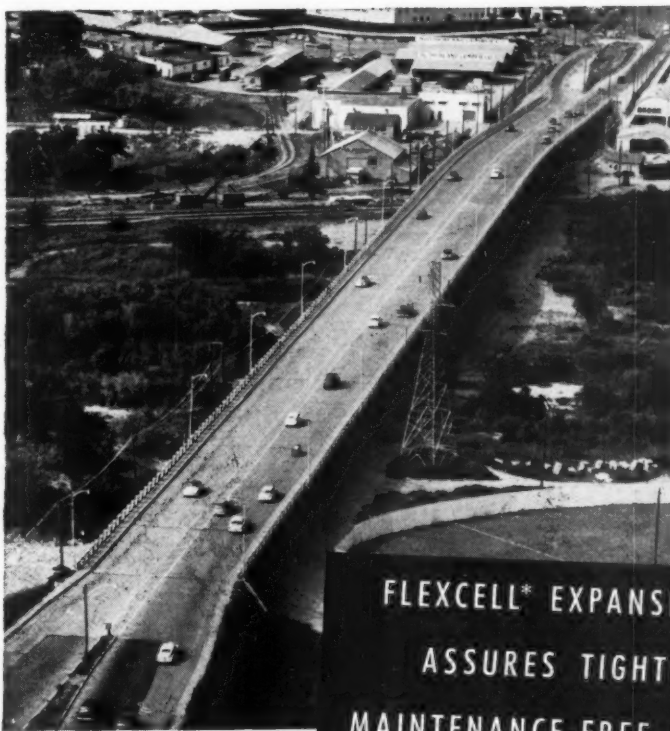
This information is placed on a Wix Oil Filter Data and Inventory Record, along with inventory control data based on the number of engines requiring each type of filter cartridge and the cartridge replacement interval. The permanent record, in a glassine display envelope, is returned to the maintenance superintendent for filing or posting. It provides not only a time-saving inventory control system, but a maintenance guide for oil-filter cartridges.

For further information, write to the company, or use the Request Card at page 18. Circle No. 98.

SHOWN in dump position, this unit is one of a variety of Load Luger bodies designed to haul heavy or light materials. Dumping the material-handling body is a powerful hydraulic hoist that is easily installed on any standard truck chassis. One of the advantages of Load Luger equipment is that interchangeable truck bodies can be used with a single truck and hoist. Capacities range from ¾ to 15 cubic yards depending on the type of material transported. For further information write to Ingersoll Kalamazoo Division, Borg-Warner Corp., 1810 N. Pitcher St., Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 115.



Smoother, easier, safer driving . . . on two Oklahoma City bridges



Norman Avenue Bridge and Exchange Avenue Viaduct
Oklahoma City, Oklahoma

**FLEXCELL* EXPANSION JOINT FILLER
ASSURES TIGHTER, SMOOTHER,
MAINTENANCE-FREE EXPANSION JOINTS**

On countless roadways of the nation where traffic is fast and road loads are heavy, Flexcell Bituminous Fiber Expansion Joint Filler is doing a job. Throughout America are roads that can take it because of this efficient joint filler. . . roads that stay smooth, free from costly maintenance problems.

In many years of demanding service, tough, durable Flexcell Expansion Joint Filler has proved a big factor in keeping maintenance costs at a minimum—even under severe traffic and climatic conditions.

Because of its resiliency, Flexcell Expansion Joint Filler compresses without extrusion, and then re-expands to keep all joints closed and smooth. Laboratory tests show a recovery of over 70% after compression to 50% of its original thickness.

Flexcell Expansion Joint Filler is impregnated throughout its entire cross-section with a durable asphaltic compound, and is protected against dry rot and termite attack by the exclusive FEROX® PROCESS. Does not become sticky or brittle with weather changes. Rough-textured surface makes firm bond with concrete.

Ideal for work requiring special cutting, tapering, fabricating.

Flexcell Expansion Joint Filler has long been specified by leading engineers, architects, and Federal, State, and Municipal agencies. Investigate the advantages of this widely-preferred joint filler before your next job.

Mail coupon for full data on benefits and economies of Flexcell Bituminous Fiber Expansion Joint Filler for roads, runways, sidewalks, curbs, gutters, driveways, concrete floors, and roof decks. No obligation, of course.

Another Famous **CELOTEX** Product

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The Celotex Corporation, 120 S. LaSalle Street, Chicago 3, Illinois

*Flexcell is a Trademark Identifying Bituminous Fiber Expansion Joint Filler marketed by The Celotex Corp.

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 243

MAIL COUPON TODAY!

The Celotex Corporation, Dept. CE-26
120 S. LaSalle Street, Chicago 3, Illinois

Without obligation, please send me complete data and prices on Flexcell Bituminous Fiber Expansion Joint Filler.

Name _____

Address _____

City _____

Zone _____

State _____

American construction know-how is making some radical changes in Seoul, Korea, where a demonstration housing project, incorporating plumbing, play areas, and other features that will be innovations for this country, is being built by the Homes for Korea program.

Sponsored by the American-Korean Foundation, the National Association of Home Builders, Webb & Knapp, Inc., New York, N. Y., and manufacturers of building materials, the program got underway November 1. The project itself is designed to provide a working demonstration of mass-production techniques in construction and is serving as a practical classroom for Korean construction men. Koreans will be taught by Americans as they work, and their training will include site planning, use of machinery, and modern business methods as well as construction techniques.

The homes, designed by a joint American-Korean architect team, combine traditional Korean styling and modern building methods. Standardized sections, and native materials have been used as much as possible, to keep the price of the homes under \$1,500.

The four 12-unit, 3-story apartment houses and 52 row houses being built under the first phase of the program will use prestressed beams and concrete block for floors and ceilings. This choice of materials and methods was arrived at largely by a process of elimination. Lumber is unavailable in the country, so some other material had to be used. Though the Republic has large clay deposits and numerous brick factories, these are operated only on a small scale. There are no facilities in the country for the manufacture of clay tile. So, despite the fact that cement had to be imported, it was decided to use concrete blocks and prestressed concrete beams for the dwellings. Projected construction with concrete should be spared the difficulty of importing cement, however, for the Republic is now building cement plants and in a few years should be able to manufacture the material in quantity.

The prestress system being used to produce the beams is that developed by the Pacadar Corp., Puerto Rico. Beams are being cast on a 600-foot-long bed, the entire length of which has been prestressed so that it will be able to expand and contract with temperature changes without showing any cracks.

After high-tensile, specially designed wires are stretched the full length of the bed, concrete of a low water consistency is vibrated into steel forms of various lengths. Then, when concrete has set, the tension on the wires is released and the entire cross section of the beam is placed in compression. The use of this method is saving both steel and concrete, and the completed beams, weighing about 20 pounds per linear foot, can be handled in the same manner as steel beams.

Prestressed concrete beams, being used as skeletons for roofs and floors, are 3 feet 3 inches on centers and are of the inverted T-type. Concrete

Mass production housing job relies on available materials

**Prestressed beam and concrete-block development
is designed to spur home construction in Korea**

by CARL G. LANS, Technical Director,
Homes for Korea Committee



Gar Wood-Buckeye 308 digs to 5 feet 6 inches deep, with optional cutting widths from 16 to 32 inches in 2-inch steps.

These high-production features put Gar Wood-Buckeyes far ahead

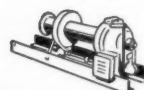
Simplified Group Controls...with panel-mounted conveyor and hoist controls, foot-operated steering controls. Control arrangement simplifies use by experienced operators, speeds the "breaking-in" of new operators.

Unit Construction provides interchangeability of major components and assemblies of all three new models.

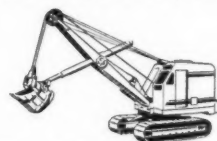
Tapered Rooter Bits fit inside holders, are pitched for proper bit angle and bucket heel clearance. Last longer... can be replaced easier and at a much lower cost.



Gar Wood
Truck Cranes



Gar Wood
Winches



Gar Wood
Excavators

GAR WOOD

Wayne, Michigan

Plants in Wayne and Ypsilanti, Michigan;

filler blocks, shaped to rest on beam flanges, provide a flat ceiling that can be plastered with lime plaster and concrete or cinder fill above so that a suitable floor surface for either asphalt tile or block wood flooring is produced.

Concrete block is being manufactured on the site by semiautomatic block-making machines. Exterior wall blocks are being produced of lightweight aggregate made by means of the sintering method. A mass of 90 per cent clay and 10 per cent coal dust, placed in a hearth and exposed to a hot diesel flame as a large volume of air is drawn through the mass, produces the clinker that is ground into aggregate from which these blocks are made. The completed blocks are almost half the weight of, and pro-

vide greater insulation than ordinary cement blocks. Additional insulation is being provided by a cavity wall. This consists of two wythes, each 3½-inch thick with a 1½-inch air space between. Each wythe is connected by wire hoops.

Though the project will mark a number of innovations in Korean construction, at least one feature of the homes will remain traditional. This is the Ondol system of heating, a radiant floor heating system that has been used in the Republic for several hundred years. The system, to be used on the first floor of the row houses, has combustion gases from a kitchen stove enter a chamber under the floor and escape through a chimney at the opposite end of the room. Grills will be used in the second

floor, and supplementary space heaters in the upstairs rooms.

A forced warm air system, using both radiant and convected heat, will be used in the apartment houses. Warm air, forced through voids in the floor system, will be convected through grills located near the outside wall, then circulated over the room to the return. The riser will be of concrete block and the horizontal supply and return ducts will be formed with prestressed, precast slabs.

The multiple-story apartments and the two-story row houses will give the Korean capital a housing development that will be able to take care of some of the high-density population without sacrificing landscaped and play areas. The development will also

serve another purpose: rentals will be used to continue a research program in home construction. The entire project, which Homes for Korea hopes will contribute to more efficient construction in Korea, is on its way to becoming a reality. Still on the agenda of the organization is arranging some means of home financing for the country.

Right now, builders and purchasers must pay cash for homes, since mortgages are nonexistent. The committee is currently considering the establishment of a fund, by means of a foreign loan at a low interest rate, that would allow Korean banks to distribute funds in the form of mortgages at 4 or 5 per cent interest. These would require a 5 to 10 per cent down payment and have an amortization period of 25 years. To safeguard such a fund, it is suggested, a strict set of controls with a standard of property requirements would have to be established so that the homes sold would be a sound security for the mortgage.

The Homes for Korea Committee has as its honorary chairman Gen. James A. Van Fleet, who originally proposed such a program. William Zeckendorf, president of Webb & Knapp, and Earl W. Smith, president of the National Association of Home Builders, are co-chairmen.

THE END

Advanced hydraulics boost production

with

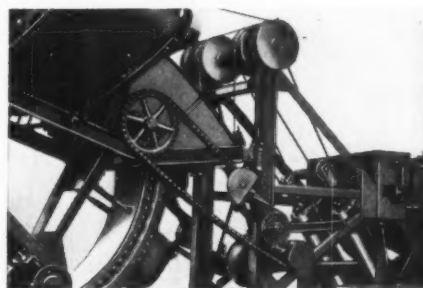


ditchers

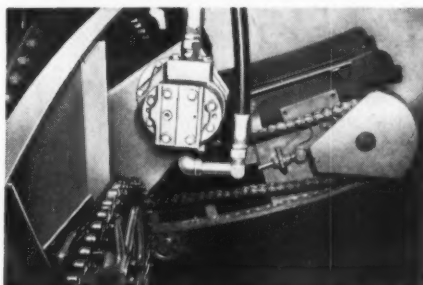
Once again, in three new job-proved ditchers, Gar Wood-Buckeye brings you advanced features that boost ditch production, cut ditching costs!

First, an *exclusive live hydraulic wheel hoist* provides faster, more accurate positioning of the digging wheel. Next, *exclusive hydraulic conveyor drive* provides three discharge speeds in either direction . . . instant adjustment to handle any volume of spoil independent of any other function. No complicated shifting, no need to stop digging wheel or crawlers. Both wheel hoist and conveyor drive are operated independently of each other and from the operator's seat. *Tractor-type crawlers* on these new Gar Wood-Buckeye models are strong and reliable . . . assure trouble-free service.

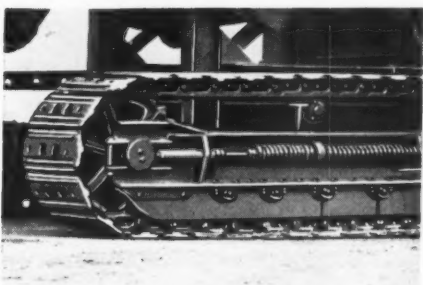
These and other Gar Wood-Buckeye features mean smooth, clean, low-cost ditching . . . more ditch per dollar with the greatest return on your capital investment. They also mean longer life, less maintenance and less downtime. They explain why contractors expect and get *more* for their money in Gar Wood-Buckeye ditchers. See for yourself by asking your dealer to show you these new job-proved models: the 305, 307 and 308. And, while you're there, find out about the full range of factory options that tailor these ditchers to *your* particular applications and digging conditions.



LIVE HYDRAULIC WHEEL HOIST positions digging wheel faster, more accurately. Digging wheel is positioned independently of all other operations. Operated from seat by simple, one-hand controls.



HYDRAULIC CONVEYOR DRIVE eliminates shock damage . . . requires less maintenance. Three discharge speeds in either direction meet any conveyor need. Completely controllable from the seat.



TRACTOR-TYPE CRAWLERS, with face-type roller seals, give long, trouble-free service life. Simplifies variation in tread width and bearing areas through a selection of pads for any type digging.

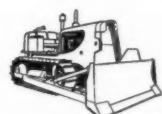
INDUSTRIES, INC.

Findlay, Ohio

Findlay, Ohio; Mattoon, Illinois; Richmond, California



Gar Wood-Buckeye Spreaders



Gar Wood Tractor Equipment



Gar Wood-St. Paul Hoists & Bodies

For more facts, use Reader-Reply Card opposite page 18 and circle No. 244

Four designs, six types of decals for equipment

The easily applied decals made by Chicago Decalcomania Co., 3310 Elston Ave., Chicago 18, Ill., are now available in four basic shapes—circle, rectangle, oval, and diamond—that permit any arrangement of firm name, address, phone number, or design. In addition to these types, the firm can make any type of transfer desired—there is no limitation on color, size, or shape. Any trade mark, slogan, logotype, or special style of lettering can be reproduced.

The firm's art department is prepared to create a design and submit it to any contractor without obligation, or a contractor can make a pencil rough of the desired decal and submit it to the company, which will prepare a full-scale sketch layout for approval.

For further information, write the company, or use the Request Card at page 18. Circle No. 132.

Vibratory rollers

A folder on the Terrapac vibratory roller is available from Vibro-Plus Products, Inc., Stanhope, N. J.

In addition to a discussion of the design and operational features of the Terrapac, the booklet contains an analysis of how a vibratory roller provides deep-down compaction.

Terrapacs are available in a single-cylinder tractor-drawn model and in a self-propelled two-roller unit.

Photographs, diagrams, and charts illustrate the bulletin.

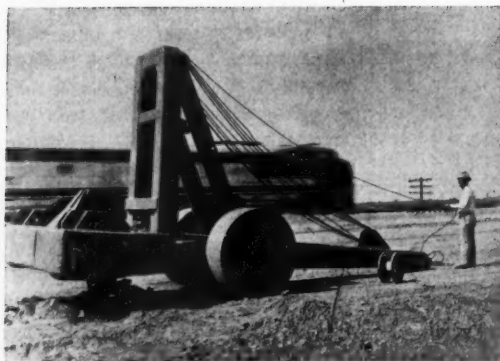
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 117.



Working with heavy gummy-like soil, made more difficult to handle because of a few days of wet weather and a high ground-water table, a Caterpillar DW21 spreads a load of the earth on a bridge approach fill.

C&E Staff Photos

Tight quarters are run



This 30,000-pound ripper, made in the shops of Morrison-Knudsen Co., Inc., Los Angeles, Calif., is used to scarify rock so that the material can be loaded by scrapers.

Many of today's engineers and contractors can remember when railroad work was one of the major phases of construction. Now, however, with the nation's rail network more complete, the annual volume of such jobs has declined until even the construction of a few miles of new main-line railroad is an unusual undertaking.

Into this category falls the construction of the 49.3-mile link between Dallas, Texas, and the main line of the Gulf, Colorado, & Santa Fe Railway at Krum, Texas. The new track will permit direct travel for passengers and freight between Dal-

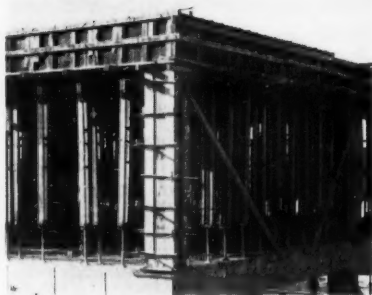
las and Chicago. Previously, both had to go to Fort Worth, 31 miles away, to catch trains for points north. Not only will the new route save time and inconvenience for passengers and shippers, but it will also permit plant sites to be developed all along its length in north Texas. The estimated cost of the line, including such things as the cost of right-of-way, engineering, construction, and other work, came to about \$7½ million.

The general contractor for the project, a joint-venture of H. B. Zachry Co., San Antonio, Texas, and Morrison-Knudsen Co., Inc., Los Angeles, Calif., had a \$2 million con-

when shoring
needs bracing
ROOSHORS
make it easier

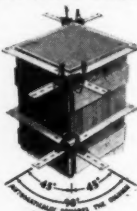
WOODEN UPPER MEMBERS

Ever try to drive a nail through bracing to hit a set hole in a metal pipe? Then you, too, would appreciate the ease in nailing bracing with ROOSHORS...their wooden upper members are the answer. The new ROOSHOR, extension type, actually gives you three shores in one... a flat-head shore, a male-head shore and an extension shore, by merely inserting any length 4 x 4 in the steel head. More ROOSHORS have been used than any other adjustable shore!



ROOS COLUMN CLAMPS

For speed and economy in column forming. Roos Column Clamps have six distinct advantages • two identical units • open either way • larger bars give greater strength • no loose parts • cannot be put on wrong • only hammer needed to tighten. ROOSHORS AND ROOS COLUMN CLAMPS are available for rental with purchase option from warehouse stocks in principal cities. Write for Bulletin 556.



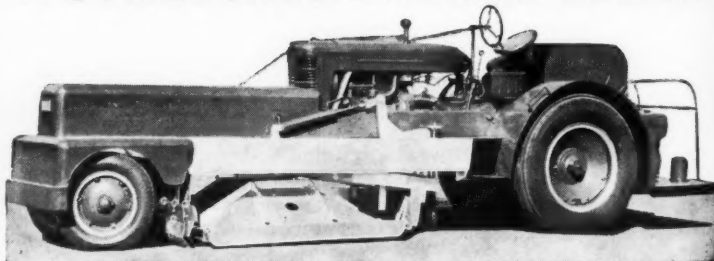
MAIL
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Baker-Ross, Inc.
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Gentlemen:
Please rush additional information, without obligation, on Rooshors and Roos Column Clamps.
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Company _____
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C&E

For more facts, use coupon, or circle No. 245

• heats,
• planes,
• renews the asphalt . .
and **STRETCHES** the TAX DOLLAR!



The MONATCO Asphalt HEATER-PLANER

thoroughly heats and softens the asphalt sheet, *without incinerating it*. In the same operation, planes off washboard corrugations, bleeding or fat—fills ruts and seals cracks with pre-heated material. Leaves a perfectly conditioned, raw, clean surface, the same as on newly laid pavement. Has proved itself on asphalt highways, streets, runways, all over the nation—not only for fast and effective maintenance—but for outstanding low cost of operation, in many cases reported as *less than 10¢ per square yard!*

OPERATED BY ONE MAN
(no special skill required)
MAINTAINS HEAT OF 2000° F. under the hood
—on standard No. 2 Fuel Oil
NO SMOKE

The only machine of its kind—protected by U. S. Patent No. 2,705,906

Manufactured by **MONATCO MFG. CORPORATION**
1401 Woodland, Kansas City, Mo.

Write for complete specifications and cost operating data. A few choice distributorships still available.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 246

CONTRACTORS AND ENGINEERS

e run big railroad grading job

A total of more than 3 million cubic yards of earth is moved for longest main-line construction in quarter of a century

tract that covered all work on the right-of-way, including grading, drainage, structures, and fencing. Actual laying of the ties, rail, and ballast was done by the railroad's own forces and equipment.

Though the contractor began preliminary operations early in 1955, and actual earthmoving operations did not start until about April 1, the entire 49.3-mile section was completed during the year, and the line was opened December 5.

The grading job, involving the excavation of 3,000,000 cubic yards of earth and 600,000 cubic yards of rock, together with the multitude of

other construction items spread over the entire length of the project, made it necessary to have several spreads of equipment working simultaneously. Because of this, the general contractor sublet some of the operations. Two contractors took over portions of the bridge and culvert construction, and four others brought in spreads of grading equipment to assist in the earthmoving operation. During much of the year, work was in progress on practically the entire length of the job.

The clearing of some 800 acres of

(Continued on next page)



Working on one of the 25 bridges on the line, a crane handles a McKiernan-Terry 9-B-3 hammer driving treated timber piling for the foundation. The stream has been diverted behind the dike, and two C. H. & E. pumps keep the hole dry.



ASPHALT MIXING PLANTS 2000 TO 6000 LB. CAPACITY

20 years experience in design and manufacture of this truly balanced equipment, assures McCarter customers of standardized parts and minimum costs.

McCarter standard plants — designed and manufactured in their own works are readily adaptable to your special requirements. Individual units also available.

- DRYERS (hot or hot & cold material, center outlet type)
- MIXERS • ASPHALT BUCKETS (Steam, hot oil or electric heated) • AGGREGATE HOPPERS • BINS • APRON TYPE FEEDERS • CYCLONE COLLECTORS • ELEVATORS • STEEL STRUCTURES

Our Sales Engineers will gladly consult with you!



**REPAIRING AND REMODELING
OLD PLANTS—A SPECIALTY**

IRON WORKS, INC. Norristown, Pa.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 247

FEBRUARY, 1956

Standard Steel MODEL 55 Tandem Roller

**1½ to 2½
TONS**

**for ECONOMY...
SPEED**



**BUILT LIKE
THE BIG ONES
PERFORMS LIKE
THE BIG ONES**

**Provides FLUSH CURB
Rolling on Each Side**

THE MODEL 55 ROLLER was designed to provide two important advantages: (1) Adequate compaction for patch rolling requirements and (2) Ideal roll dimensions for smoothing and finishing work. Ballasting is evenly distributed through the use of both steel and water ballast. Steel ballast is removable in 70# sections providing a wide choice of compaction ranges.

The Model 55 will roll to within 2 inches of wall or building on driver's side and to 4½ inches on opposite side. Eight inch ground clearance provides flush rolling adjacent to curbing. Automotive steering makes easy driving. Upholstered seat, safety seat rail, speed control, throttle and foot brake are of motor-car type — and water valve is in easy reach of operator. The maximum weight with all ballast is 4600#. Shipping weight is 3600#. Speed — from 1.75 MPH to 3.5 MPH



**TRAILERIZED FOR EASY
TRAVEL FROM JOB TO JOB**

Photo above shows ease with which roller is loaded and unloaded from trailer. One man can easily lift and hook it to towing vehicle.

Loading Ramp becomes end gate. Roller locks on trailer for safe travel at all speeds. Write for FREE Catalog and Prices



Standard Steel Works, Inc. NORTH KANSAS CITY, MO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 248



An Allis-Chalmers HD-20 tractor push-loads a Super C Tournapull in one of the cuts near the right-of-way. This is part of the spread used by Oscar Cameron, Plano, Texas, in excavating 600,000 cubic yards of earth.

(Continued from preceding page)

land, 50 per cent of it wooded, and setting up fencing along both sides of the right-of-way, started the job.

Most of the area to be cleared was covered with scrub oak, and though many of the trees were old and of some size, Caterpillar D8 tractors with dozers had no trouble bringing them down and pushing them into piles. All trees and brush were burned on the right-of-way.

The job of erecting the 96 miles of fence to separate the right-of-way from adjoining land was subcontracted to Dallas Improvement Co., Dallas. Twenty miles were fenced with woven wire or "sheep-proof" fencing. The remainder had five strands of barbed wire. Creosoted pine posts supported the wires and the aluminum gates. This contractor dug post holes with power auger attachments on rubber-tire tractors and used power winches on the tractors to tighten the wire. Much of the fencing was completed ahead of the grading operations.

Dallas Improvement Co. also moved a number of rural telephone poles and lines which would have been in the way of construction. Two pipelines crossing the alignment had to be modified, and this work was done by the pipeline companies.

Of the six earthwork spreads on the project, two were operated by the general contractor and the other three by subcontractors. One of the Zachry-M-K spreads consisted of three new Caterpillar DW21 scrapers and two new Cat D8 tractors, one of which was equipped with an Ateco ripper. In this spread also were a D8 tractor pulling a LeTourneau scraper, a D8 with a double-drum sheepsfoot, a No. 12 Cat motor grader, and a Ford 1,500-gallon water wagon.

The second spread carried four Caterpillar DW20 scrapers, together with four D8 tractors. Two of these were used for pushing, one was used with a sheepsfoot roller, and the fourth for dozing. A Cat 12 grader did finishing work for this spread. Both spreads operated two 10-hour shifts a day, seven days a week, during much of the season.

Heavy ripper digs rock

Although rock cuts were as deep as 25 feet in a few places, much of the rock excavation was shallow, or consisted of soft rock that could be loosened with a heavy ripper. A large 30,000-pound ripper, fabricated in the M-K shops, was pulled and pushed by two D8 tractors to scarify much of the rock so that it could be loaded by the scrapers. In the deep cuts, the rock was drilled and shot, then loaded by shovels.

Four subcontractors—Oscar Cameron, Plano, Texas; Trinity Construction Co., Dallas; Freeman & Ansley Construction Co., Fort Worth; and Ed Peers Construction Co., also Fort Worth—joined the general contractor on the grading. Peers used Cat DW10 and LeTourneau scrapers with the usual supporting equipment, and the others used similar spreads.

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SECTION REPAIRS—Can be handled on any tire with Firestone's repair facilities.

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You save with Firestone Traction Cap retreads or Firestone Full Cap retreads because they stand up longer and keep your downtime at a minimum. Firestone Retreads have the proved Firestone new tire tread design for greater traction, greater driver control, more hours of service.

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13.00-24	24.00-29
14.00-20	24.00-32
14.00-24	27.00-33
14.00-25	29.5 x 25
16.00-24	30.00-33
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GROUND GRIP FULL CAP

ALL NON-SKID FULL CAP

ROCK GRIP FULL CAP

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

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Since there were many long fills and most of the excavation was done within the right-of-way, hauls were usually long. This meant economy in moving most of the material with rubber-tire scrapers. Tractor-drawn scrapers on each spread handled some of the very short hauls and assisted with the sloping and fine-grading.

Material for all fills was placed in thin layers and compacted to a minimum of 90 per cent Proctor by sheepfoot rollers and the heavy equipment operating over the fills. One foot of select material was placed on the top of all cuts and fills to provide the base for the track ballast. In some cases this select material had to be trucked as much as 15 miles from outside sources. Much of it, however, was obtained from borrow pits on or near the right-of-way.

One of the complicating features of the earthwork was the relatively narrow top of the finished sections. As the cuts and fills were being completed, some of the machines had difficulty turning around on the narrow grade. Operators had to be very careful to avoid collisions and to stay on the road as their machines passed on the grade. The steep slopes, 1 to 1 in cuts and 1 to 1½ in fills in most cases, made it doubly important for the machines to stay on the road, since most of them could not operate safely on these steep slopes.

Many structures built

Since the new road intersects six railroads, seven state and federal highways, a number of other roads, and several streams, it was necessary to construct 25 bridges and four timber trestles as well as three 20 × 24½-foot concrete boxes for track to pass under highways. Smaller waterways were carried through the railroad grade in concrete box culverts or corrugated-metal pipe culverts. A total of 73 box culverts were installed, ranging from 18 to 66 inches in diameter. All had asphalt-paved inverts.

As with the grading, the structural work was split between the general contractor and subcontractors to speed up the work. Hansen & Galbraith Construction Co., Cleburne, Texas, undertook the construction of some 3,000 cubic yards of concrete bridges in the north half of the job. Russ Mitchell Inc., Houston, Texas, poured some 5,000 cubic yards of concrete in structures in the south end of the project.

The Mitchell firm had headquarters and a concrete batching plant on the existing railroad at the south end of the line. The plant consisted of a Johnson 600-barrel cement plant and a Johnson 90-ton three-compartment aggregate bin. Aggregates were charged to the bin by a Koehring 205 crane with a ¾-yard Wellman clam. As batches were weighed out, they were discharged to a Jaeger 1-yard stationary mixer. Concrete was hauled to the job sites by four Smith 4-yard transit mixers mounted on White trucks.

At the bridge sites, concrete was

hoisted to the forms by a Koehring 304 crane using Johnson and Blaw-Knox concrete buckets. As concrete was placed, it was consolidated by Viber air and mechanical vibrators.

Forms for the structures were prefabricated at the yard. Most form panels were made up of 1 × 8 shiplap, lined with ¼-inch plywood treated with A. C. Horn Formfilm. Forms were backed by 2 × 6 studs and double 2 × 6 wales and were tied with Dayton 5,000-pound snap ties. These forms were re-used at least 8 or 10 times before the plywood lining had to be replaced.

At the north end of the project, Hansen & Galbraith used a Winslow Binanbatch charged by a Schield Bantam truck-crane to produce con-

(Concluded on next page)



As the fill nears finished grade, it is shaped by an Allis-Chalmers AD-4 motor grader. Compaction is delivered by a Gebhard sheepfoot. Operators are careful in passing other machines because of the narrow width of the fill.



IMPOSSIBLE WITHOUT EXPLOSIVES

The modern highway—wide and spacious with increased visibility and no cross traffic—is a tribute to modern construction techniques. The above section of U.S. 99 between Bakersfield and Los Angeles, California, is a good example of engineering know-how. Where rock was encountered, blasting crews with Hercules explosives took over.

For more than forty years, Hercules has engaged

in continuous research into the development of explosives materials and improved blasting techniques. Whether your requirements are for construction, mining, quarrying, seismic prospecting, or in other fields where explosives are needed, Hercules technical representatives will be glad to assist in the selection of the right materials for the most efficient job.

HERCULES POWDER COMPANY

Explosives Department, 965 Market Street, Wilmington 99, Del.

Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.; Joplin, Mo.; Los Angeles, Calif.; New York, N. Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Calif.

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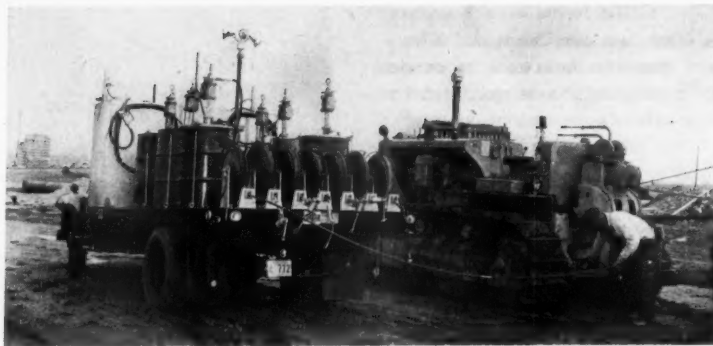
XR50-2

(Continued from preceding page)

crete for structures. Jaeger and Rex 11-S units mixed the batches, and the material was bucketed to the forms by a 3/4-yard Marion crane.

Some of the structures were built by the general contractor's crews. Concrete aggregates were spotted at the structure sites by dump trucks, and Rex 165 portable mixers were used to produce the concrete. Then a Northwest 25 crane with a 3/4-yard shop-built bucket brought the concrete to the forms. These crews used Dreyer mechanical vibrators.

Construction of the pile trestles for the projects, as well as some of the pile footings for bridge piers, was sublet to Russell Smith Bridge Construction, Dallas. A typical bridge



A Chevrolet lube truck services a Caterpillar D8 on the Zachry-M-K spread. The Alemite-equipped rig has seven reels for oil, grease, lubricant, and air. It carries tanks holding 550 gallons of diesel fuel and 150 gallons of gas for emergency use. C&E Staff Photo

footing for a stream crossing was excavated by Russel with a Northwest 6 crane using a Hendrix 1 1/2-yard dragline bucket and an Owen 1 1/2-yard clam. Material excavated for the footings was used to build a dike to divert the water, and a pair of C. H. & E. pumps kept the excavation dry. Treated timber piles were driven by a Mc-Kiernan-Terry 9-B-3 hammer in leads handled by a crane. Steam was provided by a 125-hp upright boiler.

Maintenance crews

To complete the daily lubrication of all of the Zachry-M-K equipment, the lubrication crew had to cover many miles in four lube trucks that also carried a supply of emergency fuel for both diesel and gasoline-burning equipment.

Seven Alemite grease reels on the rear of the trucks dispensed engine oil for diesels, engine oil for gasoline engines, transmission grease, chassis lubricant, track roller grease, and air. Supplies of the lubricants were pumped from barrels on the trucks by Alemite pumps, and these were powered by air from a Kellogg-American compressor driven by a Briggs & Stratton engine. A Kohler

1,500-watt light plant provided power for lights and small tools. A two-compartment tank at the front of the truck carried 550 gallons of diesel fuel and 150 gallons of gasoline for the emergency fueling of equipment.

All of this equipment was mounted on the flat bed of a Chevrolet truck. Manned by two men, the truck made the rounds of all of the general contractor's crews every day, servicing all of the equipment at least once a day.

Coordinating the efforts of the several crews and the several contractors over the 49-mile length of the project would have been a great deal more difficult without a mobile radio system (See "Mobile Radio Coordinates 50-Mile Railroad Project", CONTRACTORS & ENGINEERS, September, 1955, page 82). With a base station in the field office at Lewisville, near the middle of the job, and six mobile units in the vehicles of key personnel, the project manager was able to keep in constant touch with all parts of the job. During working hours, the General Electric mobile radio system was seldom silent.

General supervision of the entire project was in the hands of project

manager J. A. "Al" Downey. With the mobile radio to keep him in touch with the office and with other supervisory personnel, Downey was actually able to spend a large part of his time out on the job making regular visits to all of the crews. Assisting him were two project engineers, J. P. Duggan and C. M. Fisher. Supervisor of the general contractor's grading operations was Charles H. Edgerton.

The project was planned in the engineering offices of the Gulf, Colorado and Santa Fe Railroad. The construction engineer in charge of the project was W. Y. Ware. He was assisted by R. O. Nutt, resident engineer for the north half of the job, and W. V. Smith, who served as resident engineer on the south half of the work.

THE END



● Here's a catalog with money-saving tool ideas—the NEW MALL Construction Tool Catalog.

It contains hundreds of on-the-job ideas, new tool uses and applications that can save you both time and money. You will also see one of the most complete portable power tool lines manufactured.

Whenever the need for high quality, time saving construction tools arises, select MALL. Get your new MALL Construction Tool Catalog now—it's FREE and it's Valuable.

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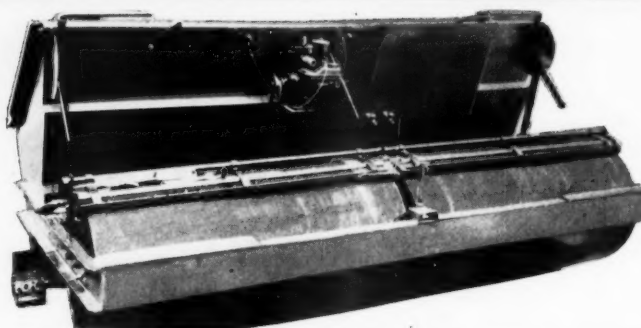
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For more facts, use coupon, or circle No. 251

60

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THE PAVING MACHINE DESIGNED AND BUILT BY A PAVING CONTRACTOR

... will do your work and cost you FAR LESS than most any other paver. Don't be deceived by appearances. This simply-built, easily-operated spreader will lay a pavement as good or better than other heavy complicated machines. It is not made for just the small jobs, but for ANY job... convenient for the small ones, speedy for the large ones. OVERMAN SPREADERS are saving time and money for contractors everywhere.

It will pay you to investigate before you buy. Let us prove to you that this machine will cost less to buy and less to operate.

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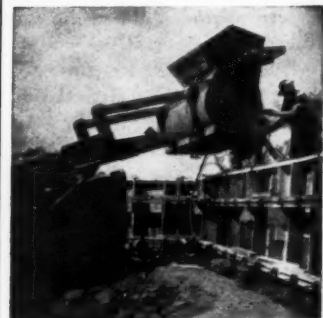
I. J. Overman Mfg. Co.
BOX 896 MARION, IND.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 252

CIMCO "THRIFTY" JET OFFERS LOW-COST LP GAS HEAT



Here's good news for contractors! It's a portable, low-cost source of heat... the Cimco "Thrifty" Jet salamander, operated on LP gas. Just pick it up and walk to wherever you need heat. You have no electric plug-in to worry about. The "Thrifty" Model S-100 sells for only \$49.50 plus cylinder. It comes equipped with U.L. approved regulator, can be ordered with whatever safety controls are desired. Contractors who want 100% clean air for inside work can order the "Thrifty" S-100 model with chimney vent. For real economy on bridge pours, the S-100 can be ordered without safety controls and used unvented. Other models available on wheels. Rely on the Cimco Jet line for all your job heat requirements.



Cimco "Bulls-Eye" concrete bucket attaches easily to front-end loader, as shown above. It allows speedy, low-cost handling of pours to low-level forms.



Cimco Twin Bin lets one man do the work of ten. Here operator controls even distribution of materials to skip by moving trip gate. For complete information, specifications and prices on all Cimco products, write:

CIMCO
Box 422 Marshalltown, Iowa

For more facts, circle No. 253

CONTRACTORS AND ENGINEERS

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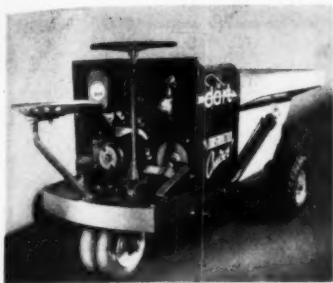
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Dart's new Construction Cruiser hauls 18 cubic feet of concrete or other material; also mounts a blade for light leveling or backfilling.

Self-propelled cart hauls concrete, does

■ Dart Mfg. & Sales Co. has announced a new concrete wagon, the Construction Cruiser, with 18-cubic-foot capacity. This hydraulic-dump unit is powered by a Wisconsin 8-hp motor, and is recommended for transporting materials for street and highway patching.

The Construction Cruiser also mounts a hydraulically controlled dozer blade for use in ground leveling or backfilling.

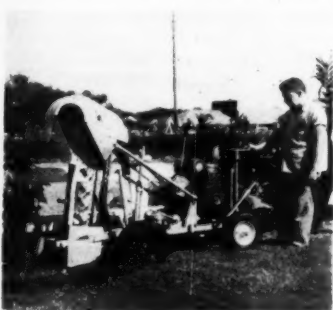
Features of the Construction Cruiser include a double compensating clutch, positive operator or drive control, and a speed range from 1 to 20 mph. Height is 48 inches, length is 83 inches, and width is 44 inches.

For further information write to Dart Mfg. & Sales Co., 1002 S. Jason St., Denver, Colo., or use the Request Card at page 18. Circle No. 86.

Small trencher unit cuts to 30-inch depth

■ Designed to reduce hand labor costs and speed the installation of small-diameter pipe and underground cable, the Ditch-Witch Model DWP trencher cuts clean even trenches to depths of 30 inches, according to the manufacturer. The Charles Machine Works.

The digging chain on this hydraulically controlled machine is equipped



The Ditch-Witch Model DWP trencher.

with closed, self-cleaning, replaceable tooth buckets of heavy steel. Buckets or teeth may be individually replaced.

The lightweight unit does heavy-duty work with its vertical-type-bucket line. Constant pull-down action doubles the rear-wheel traction and permits operation in limited space and urban areas. The Ditch-Witch does not require a skilled operator and can be hand or power-fed to meet all digging conditions.

For further information write to The Charles Machine Works, 625-30 Birch St., Perry, Okla., or use the Request Card at page 18. Circle No. 90.

Tubeless truck tire is long-life unit

■ A new tubeless truck tire with a special tread compound has been announced by The B. F. Goodrich Co.'s Tire and Equipment Division. Available for both original equipment and replacement use, the new tire is built to meet standard tubeless tire and rim assembly measurement requirements.

An armor coat of the new X-99 tread compound covers the tread of the Power Express tire. This compound helps prevent tread cracking and checking, and thus improves tire

life. The durable compound is said to remain in the tread contours between the ribs to provide full protection during the life of the tread.

The new tubeless tire, when mounted on a new drop-center rim assembly, means an over-all weight reduction of approximately 40 pounds per wheel on some popular sizes, according to the manufacturer. This allows a truck operator about 400 pounds more legal payload on a 10-wheel rig, it is reported.

Power Express tubeless truck tires cover the load capacity ranges of conventional truck tire sizes 6.00-16 6-ply through 11.00-24 12-ply. The

over-all dimensions of the new tires are the same as the conventional truck tires they replace.

For further information write to the B. F. Goodrich Co., Akron, Ohio, or use the Request Card that is bound in at page 18 of this issue. Circle No. 87.

I-H sales appointment

Duane F. Kuntz has been promoted to assistant manager of motor truck sales by International Harvester Co., Chicago, Ill. He had previously been manager of the company's Southwest motor truck sales region.



WORKABLE, PLASTIC concrete mixes made with Atlas Duraplastic Cement helped speed construction of both structural and paving portions of Ohio State Highway, Beechmont Levee Project at Cincinnati, O. Contr.: Vest & Bartell, Cincinnati.

Why will this concrete last longer?

Both paving and structures are built to last longer . . . when they're made with Atlas Duraplastic* air-entraining portland cement. For Atlas Duraplastic cement gives concrete greater durability . . . fortifies it against freezing-thawing weather and scaling caused by de-icing salts.

Atlas Duraplastic cement also gives concrete mixes greater workability that aids proper placement . . . gives them more cohesiveness to resist segregation. Paving jobs finish easily, and in structural concrete, surface appearance is improved.

YET DURAPLASTIC COSTS NO MORE than regular cement — requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write:

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*"DURAPLASTIC" is the registered trade-mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

AIR-ENTRAINING PORTLAND

Atlas® Duraplastic Cement

MAKES BETTER CONCRETE AT NO EXTRA COST

United States Steel Hour—Televised on alternate Wednesdays—See your local newspaper for time and station.

For more facts, circle No. 254→

FEBRUARY, 1956



The improved Oliver OC-18 crawler features Power-Turn steering for greater maneuverability.

Improved crawler boasts power steering feature

■ Many new design features are incorporated in the improved Model OC-18 crawler tractor announced by the Oliver Corp. Powered by an Oliver 161-hp full-diesel engine and weighing 32,500 pounds, the new OC-18 mounts a full line of matched allied equipment.

The manufacturer particularly calls attention to the OC-18's Power-Turn steering, which combines the advantages of Oliver's controlled differential steering with the advantages of clutch steering. The new Power-Turn feature permits operators to make spot turns or gradual turns of any angle. Without shifting, the operator can decrease speed by 38 per cent with an increase in draw-bar pull or push of up to 60 per cent, depending on weight and traction.

For this new steering method the controls have been regrouped for easy, simultaneous handling of more than one lever by the operator. Four fingertip levers provide full maneuverability of the new OC-18. There are both hand and foot positive braking.

Improvements have been made to the heavy-duty track frame and tracks, and the machine boasts a more rugged and efficient transmission. A Hi-Life wheel system featuring antifriction bearings is also available.

For further information write to The Oliver Corp., 400 W. Madison St., Chicago 6, Ill., or use the Request Card at page 18. Circle No. 35.

Tractor-mounted winches

■ Pacific Car & Foundry Co., Renton, Wash., has issued two specification sheets featuring Carco winches Model C and Model E-24. Engineered and built for the Oliver crawler OC-12 tractor, the Model E-24 is for one or two-man towing operations. The Model C, designed for the Terratrak 200, 300, 400, and 500 tractors, is recommended for lighter pulling, hoisting, and skidding jobs.

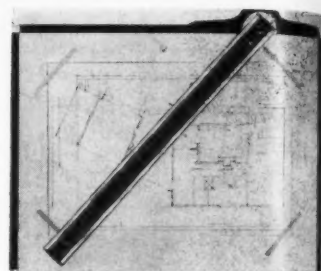
To obtain these sheets write to the company, or use the Request Card at page 18. Circle No. 14.

Unique drafting board has T-square, protractor

■ A combination of a unique drawing board, a patented angular T-square, and a protractor is announced by Weller Engineering Co.

The new board eliminates the need for a cumbersome drafting arm in 75 per cent of drafting work. Angular drawings are handled by determining the proper angle desired and setting the indicator on the protractor at the proper degree. The unique construction of the T-square and protractor is said to insure perfect parallel lines. If a 90-degree angle is desired, the T-square indicator is set at right angles and automatically locks in position.

The 24 x 32-inch drawing board is



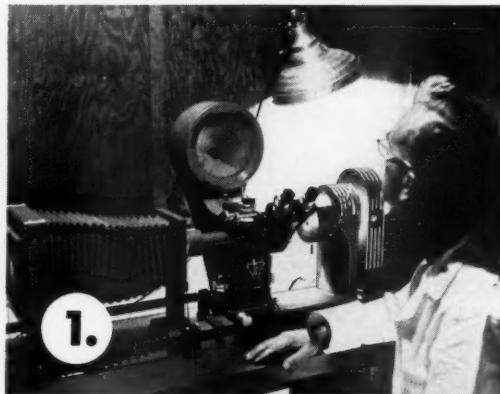
This Weller draftsman's instrument combines a drafting board, an angular T-square, and a protractor.

made of Finnish white birch, and other select materials, and the complete board is covered with a replaceable high-grade covering of laminated paper which is moisture resistant. Guide rails, which insure perfect angulation of the T-square, are of

Tuffy® Tips



Here Are Some Of The Steps Taken To Pre-Determine Tuffy Toughness And Assure Longer Rope Life



1. Metallographic Examination. Under powerful magnification, Union Wire metallurgists examine the microstructure of the steel in rods and wires to see that rigid specifications are met and maintained in processing.

2. Chemical Analysis Laboratory. Steel for Union Wire Rope is made to rigid specifications. Here rods and wire are chemically analyzed to make certain that the correct combinations of carbon, manganese, etc., are kept under control.

3. Designed by Union Wire Rope Engineers. This accelerated fatigue tester is equipped with sheaves from 8" to 24" permitting application of any bending stress. Tensile loads up to 12,000 lbs. are applied. Thus wire rope life under toughest fatigue conditions is pre-determined.

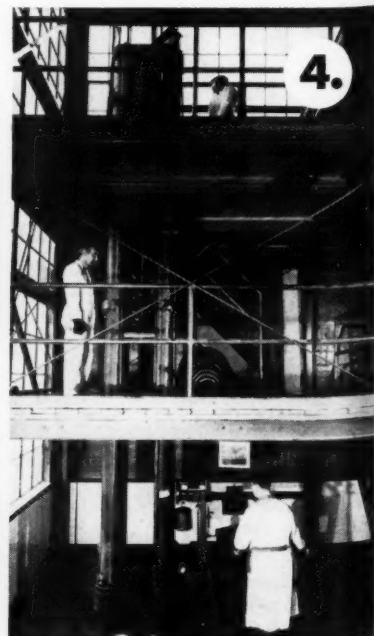
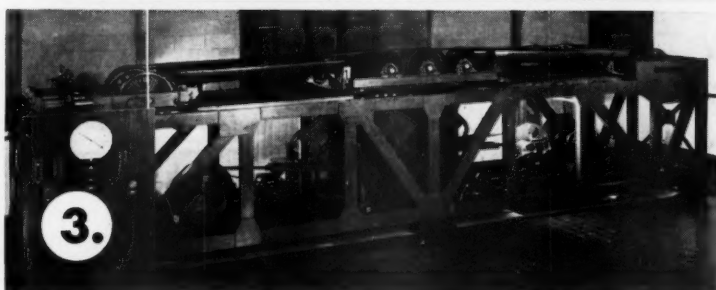
4. Rope Testing Machine. This 3-story high machine is designed to test and record the breaking strength of the rope when finished and ready for the customer.

5. Static Flexibility Tester. The demand of machinery engineers toward smaller sheaves and higher speed made it necessary for Union Wire Rope Engineers to adapt this standard machine in order to test static flexibility.

6. Wire Tensile & Torsion Tester. In tension and under torsion, this machine tests wires to see that they measure up to the extraordinary high level of strength and toughness mandatory in Union Wire Rope.

7. Another View Of Accelerated Fatigue Tester. Shows simultaneous testing of three different wire rope constructions. Here, in days, ropes are subjected to punishment equal to weeks or months of hard service.

8. Wire Fatigue Testers. The fatigue strength of wire rope is the sum total of the fatigue strength of the wires in its construction. Here, the wires in tension and bending are tested for fatigue strength.



tempered aluminum, and are on three sides of the board. The T-square is constructed of mahogany. Legs are cushioned with rubber to provide protection for a desk.

For further information write to Weller Engineering Co., 169 La Verne Ave., Long Beach 3, Calif., or use the Request Card at page 18. Circle No. 67.

Exhaust sparks trapped by centrifugal action

Incandescent sparks from the exhaust of internal-combustion engines are safely trapped by centrifugal force in the new Gill spark arrestor manufactured by Erickson Products Co.

The stainless-steel unit is attached on the end of the exhaust pipe. The



hot carbon particles are carried to a removable cup-collector for periodic disposal of the carbon. Exhaust gases escape through a large central opening.

This method of trapping dangerous

sparks does not use screens which sometimes clog, nor multi-fins that need cleaning and maintenance. It is a simple centrifugal spark-collecting principle said to offer full protection from incandescent exhaust carbon in hazardous areas. With the arrestor, there is negligible back-pressure on the engine, elimination of moving parts, no maintenance, and no hazard from sparks, according to the manufacturer.

For further information write to Erickson Products Co., 43 Dore St., San Francisco 3, Calif., or use the Request Card at page 18. Circle No. 83.

Glass-reinforced paper

Angier Corp.'s waterproof Glass-mat for concrete curing, road build-

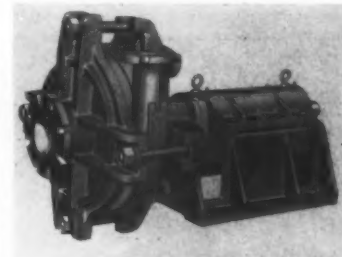
ing, building and materials protection, and for use as tarpaulins is the subject of a folder from that firm. Pictures, specifications, and descriptions of other papers made by the company are also included.

To obtain this folder write to Angier Corp., Framingham, Mass., or use the Request Card at page 18. Circle No. 21.

Ease of maintenance feature of new pump

A heavy-duty and suction pump, easily dismantled for maintenance, has been added to its line of slurry pumps by Morris Machine Works.

The new Type Q pump, a low-speed, continuous-duty unit, is designed to handle abrasive slurries of



This new Morris heavy-duty pump is easily dismantled for maintenance.

cement, sand, coal, solids, chemical sludges, and other products up to the maximum fluid consistency under suction lift or positive head. The all-metal pump is available in seven different models from 2 to 6-inch size.

By removing only four bolts, workmen can open the pump for most maintenance requirements without disturbing the piping. Interchangeable liners on both sides of the impeller put the wear on easily replaceable parts. External vanes on both sides of the impeller prevent packing between the impeller and casing. The impeller is pressure-balanced to prevent recirculation, and is threaded to the shaft and sealed against corrosive action.

For further information write to the Morris Machine Works, Baldwinville, N. Y., or use the Request Card that is bound in at page 18. Circle No. 41.

New transit bob cord improves visibility

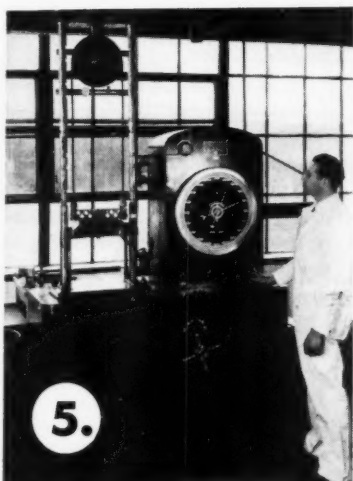
New 50-pound-test yellow nylon cord has been added as a standard accessory on all transits manufactured by W. & L. E. Gurley. The new cord is said to add greatly to the visibility of the plumb bob string, especially in conditions of poor lighting. Also, the wear quality of the nylon is superior to the liner usually used, according to the manufacturer.

Gurley also offers a small metal cord adjuster, which enables the instrument man to make quick changes in line length in the field.

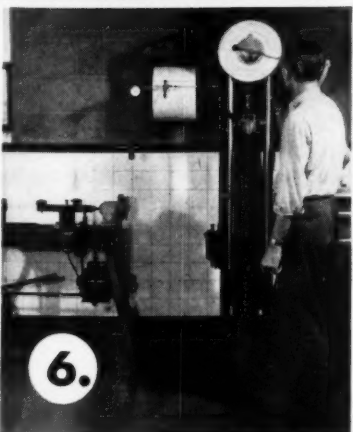
A set of cord and adjuster, with illustration showing how to use the two together on any transit, is available for a nominal charge.

For further information write to W. & L. E. Gurley, 518 Fulton St., Troy, N. Y., or use the Request Card that is bound in at page 18. Circle No. 66.

How Research Puts Longer Service Life Into WIRE ROPE



When you specify one of the Tuffy Wire Ropes, you can say Tuffy and forget complicated specifications



Tuffy Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Save wasting sound rope—mount a reel on your scraper.



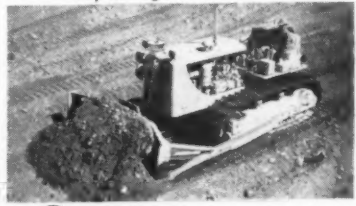
Tuffy Slings and Hoist Line

Tuffy Hoist Line, a longer running rope on all types of hoists. Slings of 9-part machine braided wire fabric. Kinking or knotting will not materially damage fabric.



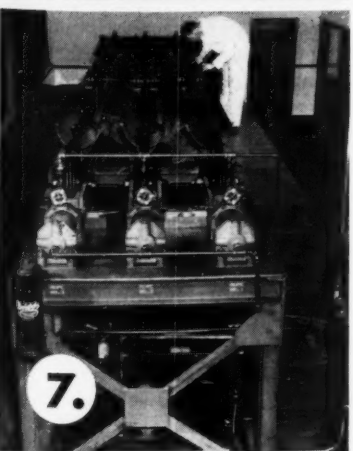
Tuffy Dragline

Constructed to give you maximum abrasive resistance with extra flexibility. Rides smoothly on grooves, hugs the drum when casting for full load.



Tuffy Dozer Rope

Increases service life . . . reduces down-time. 150' reels mounted on your dozers let you cut-off worn sections without wasting good rope. 1/2" and 9/16" diameter.



Your Tuffy Distributor Works For You

He's the man who can help you find a fast answer to all your wire rope problems. He's also the man who often knows as much about some requirements of your equipment as the men who made it. He's the man who's eager to supply the kind of service that will hold your patronage. Feel free to call on him anytime.

union Wire Rope corp.

2260 Manchester Avenue Kansas City 26, Missouri
Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

For more facts, use Reader-Reply Card opposite page 18 and circle No. 255



Portable rock plant fills three orders simultaneously

While one man operates the Pioneer 46-VE as it works on a single size of aggregate, another man picks roots, clay lumps, and other debris from the raw material entering the plant and throws them into a truck for disposal.

Subdivision development and other construction, and the subsequent need for roads in the metropolitan Detroit area, have created such a pressing need for crushed road-building material that one producer, F. S. Ward, sold out an 8,000-cubic-yard stockpile in two days not too long ago. But Ward, seeing the demand growing, had a portable rock crushing and screening setup installed at his pit site, and this unit is taking care of all orders more than adequately.

Until the new plant was installed, the firm was working with a stationary rock plant at the pit, a 25-acre site near Lake Maceday, about 30 miles northwest of the city. The pit itself, a natural deposit of well-rounded gravel mixed with clay and silt, made it impractical for a stationary setup to turn out the amounts of material required in this portion of the state. There are other difficulties too: occasional rains wet the clay in the pit, making the material a little tough to handle. Yet though pit fines do not meet rigid plasticity-index specifications, they can be mixed with rock from the pit to make the PI value of the material go down to a point that makes the final product an excellent base course.

Ward's portable Pioneer 46-VE setup, supplementing the stationary plant, works ten hours a day and five days a week, turning out 150 cubic yards of material hourly at the peak of operations. And despite some difficult working conditions at the pit, it has handled well over a quarter million cubic yards of raw material since it was purchased.

Only two men work the plant—the plant operator and a man who works from a platform on the input conveyor, picking debris like roots and clay lumps from the raw material. This is thrown into a waiting truck for disposal. General superintendent Maurice Spring supervises plant operations, while direct plant supervision is done by Earl Spring.

Normally, a 1-yard dragline works from a perch on a high bank, cleaning up all pit-run material within its reach. Excavation is being carried down to water table, the level of nearby Maceday Lake.

Work on three orders

One of the plant's biggest jobs cropped up shortly after its installation. This called for the production of 1 1/4-inch-minus base-course material, 1 1/4-inch-minus crushed rock for hot-mix bituminous aggregate, and 1/4-inch-minus material—also

safeguard workmen... save materials... with

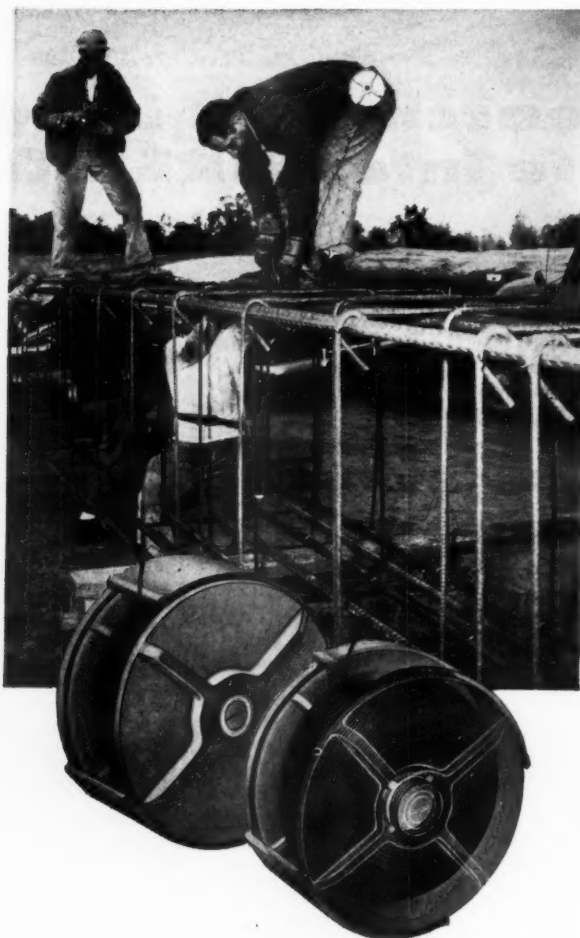
Today, there's a modern way to make re-bar ties that not only increases the safety of your workers, but also reduces job costs. That's the use of Cal-Tie Wire in handy reel dispensers.

Safety conditions are improved because there are no clumsy shoulder coils to catch on protruding objects and throw workers off balance... no loose ends to injure eyes or scratch workers. And—by eliminating this old-fashioned method—you reduce waste resulting from excessive cut ends and coils put down and forgotten.

You keep worker efficiency high, too. Light and compact, Cal-Tie Wire on reels can be used in tight quarters. Kinking and tangling of wire does not occur. Cal-Tie Wire in reels is always handy but never gets in the workers' way.

Try this up-to-date re-bar tying method—Cal-Tie Wire in handy reel dispensers—on your next construction project.

Cal-Tie Wire, manufactured by CF&I from its own steel—from ore to finished product—is available in gauges 14 through 20, annealed or galvanized. It fits all standard tie wire dispensers. For additional information, contact our sales office or the nearest CF&I distributor.



CAL-TIE WIRE in handy reel dispenser



CAL-TIE® WIRE
THE COLORADO FUEL AND IRON CORPORATION

3593

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso • Ft. Worth
Houston • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle
Spokane • Wichita • WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver

For more facts, use Reader-Reply Card opposite page 18 and circle No. 256

Aggregates for base course, hot-mix, and concrete are turned out at 150 tons per hour by pit setup

(Additional photo on front cover)



Finished material, carried by conveyor belt to a Pioneer stacker conveyor, is pushed to a storage area by an electric Model C Tornado dozer. In ordinary operation, the plant is fed by the 1-yard dragline, background.

crushed 100 per cent—for use in the manufacture of precast-concrete sewage components. Ward filled the order, producing material for all three purposes simultaneously.

His first task was to select a pit area where clay or other fine material was insufficient to affect the quality of the base material adversely. Thus, the raw input was gaged so that the minus-1/4-inch fraction contained enough natural rock and gravel to meet specifications. The plant was gravity-fed, a LeTourneau-Westinghouse rubber-tire Tornado dozer pushing the material to a trap. A Pioneer apron-type feeder moved material into the plant over a conveyor run, which dropped the raw material to the bottom deck of the plant.

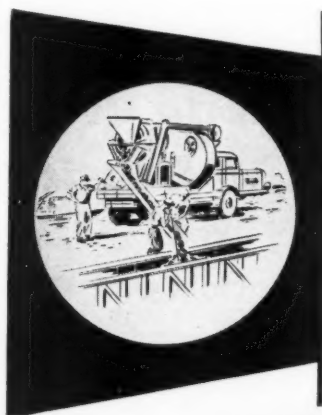
Material already meeting specification sizes dropped through this screen and was brought to the stockpile by a Pioneer stacker conveyor. Oversize material retained on the bottom-deck screen was used in producing 1/4 and 1/2-inch material.

This oversize was dropped from the bottom-deck screen into a Pioneer 10 x 36 jaw crusher, which is standard on the 46-VE. Throughs from the jaw passed to the top deck of the Pioneer screens in the plant. Oversize retained on this top deck was sent through a set of Pioneer 40 x 22 rolls, which were set in closed circuit with the top screen deck so that material could be further reduced. This top deck was sized to agree with maximum-size asphalt aggregate grading specifications. Material dropping through this screen was retained on the second deck, then taken out a side chute and over a Pioneer elevating conveyor to a temporary surge bin. The finer crushed-rock fraction, used for precast-concrete work, was also pulled from the second deck of screens and chuted out the opposite sides of the plant.

All during this operation, the plant worked at near-peak capacity of about 150 cubic yards per hour. About 45 to 50 cubic yards of this was crushed rock meeting Michigan's specifications for a 9-A and 25-A material.

Currently, Ward's setup is producing a steady flow of road-building material, while meeting the abnormal demand for other sizes of rock easily. Finished material is being stockpiled by the Pioneer stacker conveyor, and the LeTourneau-Westinghouse dozer is shoving it to the lip of a large storage area at the discharge end of the conveyor belt.

THE END



now! 18,000 lb. payload on each axle with the NEW 4-wheel drive

Oshkosh

READY-MIXED CONCRETE CARRIER



18,000 LBS.

With 18,000 lbs. equal weight on each axle, the Oshkosh FIFTY-FIFTY conforms to maximum load limits in most states.

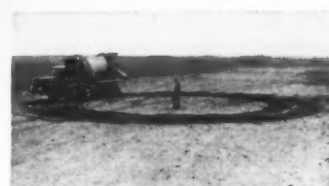
18,000 LBS.

Never before has there been a ready-mixed concrete carrier like Oshkosh's FIFTY-FIFTY! Up to 5 cubic yard capacity means greater payloads — increased profits! Powerful 4-wheel drive traction lets you spot loads under adverse conditions . . . get jobs competition can't handle! Two driving axles means lower maintenance cost and its 144" wheelbase means greater maneuverability. Easy to service — just lift side panels for instant access to engine! Write for details and how you can have an on-the-job demonstration without obligation!

Be sure to visit our exhibit at the National Ready Mixed Concrete Association Convention, Chicago, Feb. 13-16, 1956

WRITE FOR FREE BROCHURE

This colorful, fact-filled book gives all the technical data and specifications of the new Oshkosh FIFTY-FIFTY ready-mixed concrete carrier. Write or wire for your free copy today!



Fully loaded Oshkosh 50-50 ready-mixed concrete carrier demonstrating short turning radius and excellent flotation while making 25 consecutive turns in soft beach sand at Idlewild Airport, New York, New York.



Oshkosh 50-50 ready-mixed concrete carrier with high level pouring spout eliminates double handling of concrete. Photo taken at New Penn Daw School, Alexandria, Va.

OSHKOSH

4 WHEEL DRIVE TRUCKS and 6

OSHKOSH MOTOR TRUCK, INC. OSHKOSH WISCONSIN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 257



The Pettibone Mulliken Speed Swing yard crane unloads form lumber and other materials, handles equipment parts, and performs a variety of jobs for the contractor.

Versatile yard crane with 180-degree swing

■ The new Speed Swing yard crane manufactured by Pettibone Mulliken Corp. extends the versatility of the Speed Swing loader to those applications requiring a highly mobile rubber-tire yard crane.

The same full 180-degree boom swing of the Speed Swing loader is incorporated in the new yard crane design, which contractors reportedly will find a useful machine for unloading forms or other materials and for use around the service shop. Its 5,000-pound capacity makes the Speed Swing yard crane especially valuable in handling heavy materials and equipment parts, while its fast, precise boom swing permits easy loading and unloading of freight cars and trucks. The long boom makes it easy to move heavy loads through narrow entrances.

The Speed Swing yard crane is available with two or four-wheel steer and two or four-wheel drive. It is equipped with full Pettibone torque converter for inch-by-inch crowding without shifting gears. Hydraulic steering, 4-wheel hydraulic booster brakes, and full hydraulic control are standard.

For further information write to Pettibone Mulliken Corp., 4720 W. Division St., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 89.

All-purpose hose

■ A mailing piece from Quaker Rubber Corp. illustrates an all-purpose hose for air, gas, or water service for a multitude of heavy-duty uses. Specifications and a size chart are given.

To obtain this literature write to the Quaker Rubber Corp., Division of H. K. Porter Co., Inc., Tacony and Comly Streets, Philadelphia 24, Pa., or use the Request Card at page 18. Circle No. 16.

Power tools, accessories

■ Complete specifications, prices, and advantages of the Power Shop, a precision-built arm-type power tool, are contained in a 20-page catalog from DeWalt Inc., Lancaster, Pa. Pictures of the various tools show to what advantage each may be used.

To obtain this catalog write to the company, or use the Request Card at page 18. Circle No. 24.

Line of hammer bits for impact drilling

■ A new tungsten-carbide-tipped hammer bit in sizes from 3/16 inch through 1 1/2 inches has been developed by Tilden Tool Mfg. Co. These bits are of the solid chisel-point type through 5/8 inch, and core type with patented core slot in larger sizes having multiple carbide cutters.

According to the manufacturer, the advantage of the core-type hammer bit is that it drills only the perimeter of the hole, thereby appreciably increasing the capacity of the hammer and drilling speed in hard masonry or rock.

The new Tilden hammer bits will operate successfully in self-rotating



air or electric hammers, as well as standard hammers employing turning chucks. Removable extension shanks and extra length bits are available.

For further information write to Tilden Tool Mfg. Co., 209 Los Molinos, San Clemente, Calif., or use the Request Card at page 18. Circle No. 33.

Indiana Toll Road Contractors use STANDARD Lubricants and Fuels

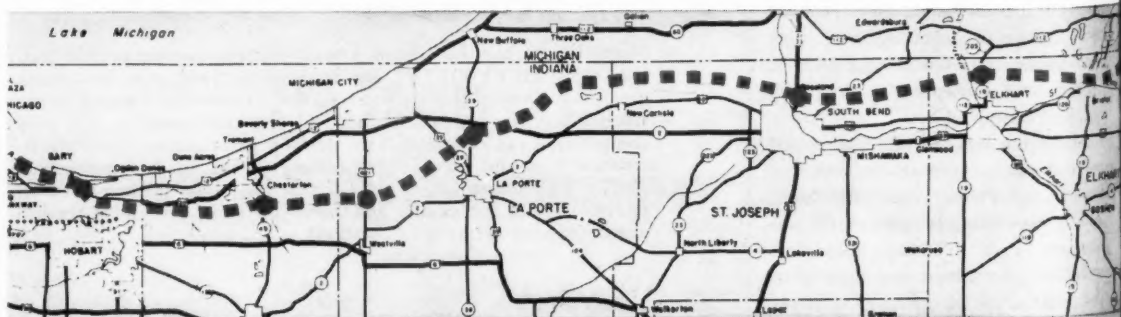
Prime contractors and sub contractors on the project choose STANDARD.
Reason: 1 top quality 2 service

The Indiana Toll Road is the biggest construction project ever undertaken in the State of Indiana. All parts of the job are going at a high production rate. To maintain such a record, contractors must get top performance from equipment. STANOLUBE Motor Oils, STANDARD Diesel Fuels and STANDARD Gasolines help them get this kind of performance—with plenty to spare—from all types of equipment, under all operating conditions, in any weather.

To keep on schedule, supplies of lubricants and fuels have to be where needed at any hour, day and night. Standard Oil maintains stocks at the

job site for every one of the contractors served. Equipment never waits for fuel or lubricants. Time down for maintenance is cut to minimum.

This is big construction. Small wonder that on this project from borrow pit and fill, from pile driver to batching plant, construction equipment uses STANDARD lubricants and fuels. Big job or small, let Standard be your supplier. In any of the 15 Midwest and Rocky Mountain states, Standard Oil automotive lubrication specialists are nearby and ready to help you. Call them or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



Indiana Toll Road traverses state from Hammond, Indiana to junction with Ohio Toll Road, a total of 153.3 miles of four lane highway. Completion date: Fall, 1956.



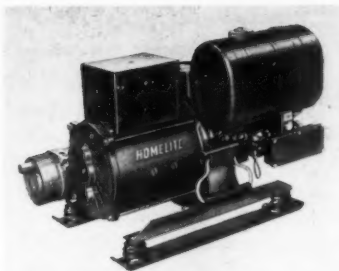
Rieth-Riley Construction Co., a prime contractor, cuts time out for lubrication maintenance by using lube truck; services construction equipment right at the job. Rieth-Riley has contract for building 7.4 miles of highway in St. Joseph and La Porte Counties; sets fast pace for equipment, uses Standard Oil products.

Allis Chalmers HD 21 "push-loading" Euclid scraper in borrow pit on Union Building & Construction Corp., job. Union is building 13.1 miles of Toll Road in Steuben and La Grange Counties and four miles in Lake County. They are one of the prime contractors on the project served by Standard Oil.

New field generator rated at 1,500 watts

■ Small size, light weight, close voltage regulation, and generous overload capacity are among the features combined in the new 1,500-watt generator announced by Homelite. The new 35A115 is a 115-volt, 60-cycle ac generator designed to operate all types of portable electrical tools and to provide standby power in emergencies.

Equipped with four conveniently located outlets, the 35A115 can operate several tools simultaneously. It has a generous overload capacity to insure steady service and prevent tool stalling, even when starting loads exceed operating loads. Weight is only 90 pounds.



Completely new is the simple electro-mechanical idle control, available as an accessory for the 35A115. Containing only three parts—a rectifier, a relay and a solenoid—the Homelite idle control automatically switches the engine to idle speed when no current is drawn, and immediately brings

the engine to full speed when load is applied. This control feature is said to reduce engine wear, increase service life, and cut fuel consumption.

For further information write to Homelite, 71 Riverdale Ave., Port Chester, N. Y., or use the Request Card at page 18. Circle No. 85.

Introduce new models of slump indicators

■ A new line of concrete slump indicators has been developed by Imperial Construction Equipment Co.

Two models have been announced in detail. An indicating model shows the slump of the concrete in the mixer during the mixing cycle. An accurate reading of the inches of



This new Tel-a-Slump indicator shows concrete slump during the mixing cycle.

slump shows on the instrument dial of this model at all times while the materials are being mixed.

An indicating and recording model performs these operations, and also prints a graph showing a complete record of the consistency of each batch in inches of slump and other pertinent facts incidental to a permanent record.

Readability is said to be greatly improved in the new Tel-A-Slump models by the introduction of a heavy dampening action which reduces needle fluctuation to a minimum.

For further information write to the Imperial Construction Equipment Co., 230 W. North Ave., Northlake, Ill., or use the Request Card at page 18. Circle No. 27.

Cathodic pipe-protection

■ "Cathodic Protection Systems for Corrosion Control" describes the Harco Corp.'s method of halting existing corrosive action or keeping new installations, particularly underground pipelines, free of significant corrosion damage. Details of typical installations, drawings, photographs, and information on the savings said to result are included. The firm's engineering services are outlined in the final section of the brochure.

To obtain Brochure 4078-HC write to The Harco Corp., 16925 Broadway, Cleveland, Ohio, or use the Request Card that is bound in at page 18. Circle No. 62.

Aluminum bridge railings

■ Reynolds Metals Co. has published "Aluminum Bridge Railings . . . 1955." The 52-page book illustrates the designs which use aluminum most efficiently, and contains a study of architectural considerations; complete design details; recommendations for joints, endings, and post settings; surface treatment data; and insulation information. A section on components lists standard structurals and nine extruded shapes. A table compares aluminum railings with steel, and the maximum impact or maximum break-down strength of aluminum as compared to steel is shown.

To obtain this catalog write to Desk PR, Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky., or use the Request Card at page 18. Circle No. 57.

←For more facts, circle No. 258



Equipment Superintendent, Lewis A. "Shorty" Martin (right), and Standard automotive lubrication specialist O. H. "Grit" Collier discuss parts maintenance at Western Contracting Corporation field shop. Field technical service such as this is old stuff to Grit Collier. He has been doing such work for 10 of his 22 years at Standard Oil. Grit is a graduate of the Standard Oil Sales Engineering School. Customers find this experience and training pay off for them.

Quick Facts About STANOLUBE Motor Oils

- 1 STANOLUBE Heavy Duty Motor Oils are refined from high quality base stock.
- 2 Additives exclusive with STANOLUBE Heavy Duty Motor Oils retard oxidation, reduce formation of piston and ring belt deposits.
- 3 These additives in STANOLUBE Motor Oils prevent fuel from forming varnish and sludge.



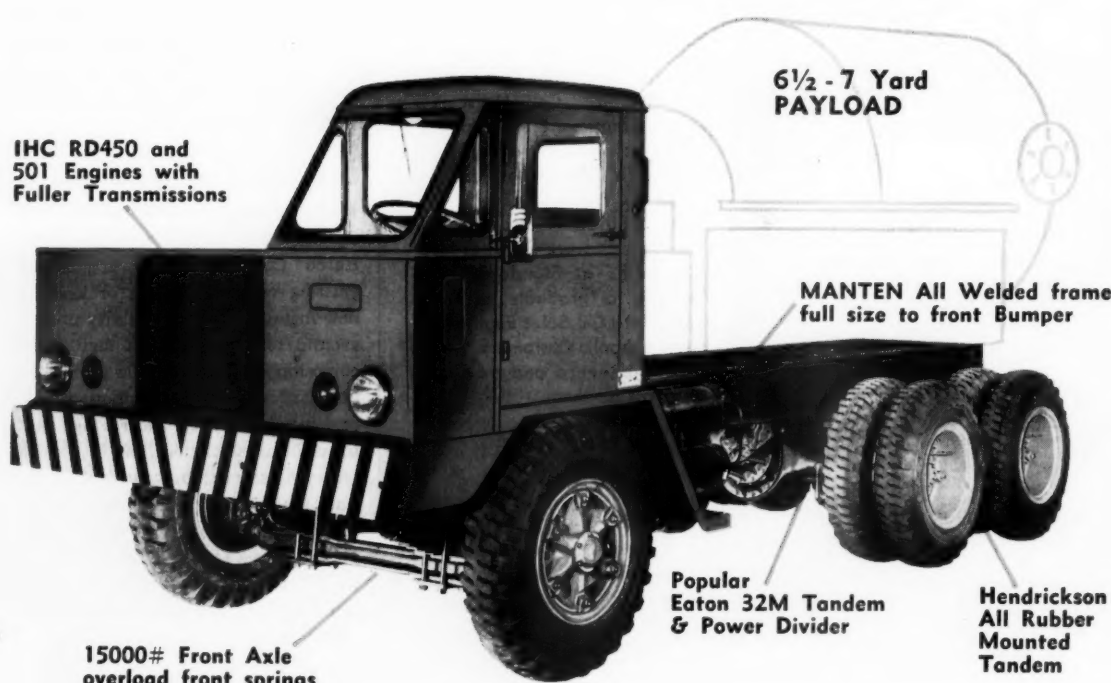
STANDARD OIL COMPANY
(Indiana)



You can decrease your tax bill through your choice of depreciation and the method of filing the return

HOW
you pay your taxes
determines
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"THE MIXER-MASTER" WITH TORQUE CONVERTER



NOW... YOU CAN HAVE
Balanced STRENGTH

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P. O. BOX 5008, TULSA, OKLAHOMA

Transportation Designed
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Low Initial Investment
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Parts & Service Available
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WRITE TODAY!

CRANE CARRIER CORP., P. O. BOX 5008,
TULSA, OKLAHOMA.

Please send complete information on the
revolutionary "Mixer-Master" carrier chassis.

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COMPANY _____
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CITY _____ STATE _____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 259

The Ides of March holds little terror for anyone these days, but another day next month—income tax deadline—has probably been worrying a lot of people for some time. The situation has one ironic twist: though everyone tries to save money on taxes, many businesses actually overpay the government year after year.

The important thing to remember in paying taxes is this: your total tax can be larger or smaller, depending on the kind of tax return you choose to make. Sometimes you can save money legitimately by shifting taxable income or deductions from one year to the next. You may even lower the amount of your tax by the way you treat such items as depreciation and research costs in your return.

Choice of depreciation

In figuring depreciation, the first step is to determine the estimated useful life of any asset acquired during the tax year. Bulletin F, containing tables of "average" useful lives, and available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 30 cents, is a useful guide, though these tables do not have to be followed exactly.

Straight-line depreciation, the simplest method, can be figured by first taking the price of equipment, then subtracting the price you expect to sell or trade it for when it is replaced. Divide this result by the years of estimated useful life of the equipment to get the amount to be deducted as depreciation each year. When figuring this, be sure to include freight and installation charges as part of the original cost of equipment.

Several other methods of depreciation can be used for equipment having a useful life of three years or more. Under the declining balance method, the depreciation rate in the first year is double what it would be under the straight-line method. The next year the same rate is applied to the amount remaining to be depreciated. This rate is applied to the remaining amount in subsequent years. The effect of this is to have a greater proportion of the cost of the asset depreciated during the early years of ownership.

The "sum of the years' digits" method is similar in effect. The best thing to do is to figure depreciation on a new asset in all possible ways so that you can see clearly which method would be best for you.

Other choices

Although a provision of the 1954 Internal Revenue Code allows some proprietorships and partnerships to be taxed as though they were corporations, there is a considerable amount of uncertainty about the provision. Proprietorships or partnerships wanting corporate tax treatment might find it better to incorporate.

The present tax law holds that payment to sick or injured employees is not taxable as part of their income. Limited amounts of "sick pay" provided for employees as part of a

CONTRACTORS AND ENGINEERS

company plan are tax-exempt, whether the money is paid out by your firm, or by an insurance company. If sickness or injury causes an employee to be hospitalized for even one day, during the time he is not at work, the first \$100 per week of payments are tax-free. If hospitalization is not required at all, the exemption begins on the second week of the employee's absence.

Records of amounts paid to ill employees should be kept accurately so that difficulties will be held to a minimum when figuring this item into your tax return. This, of course, applies just as well to any other financial records. Lack of adequate business records may result in your losing many deductions to which you are legally entitled. Your records should show your deductible expenses throughout the year, so that they can be used to support your tax return if it is questioned by the Bureau of Internal Revenue. To be complete, they should show out-of-pocket business expenses, such as travel and entertainment of customers.

You can save in taxes by billing repairs and improvements to your business property separately. If these are lumped together, you may find that the entire cost has to be capitalized for future depreciation, but if you list them separately, the cost of repairs can be deducted as an expense of the current year.

In some cases, regulations now permit a firm to change its fiscal year without the permission of the Treasury Department. While this in itself will not lower your taxes, it has other advantages. Generally, it is wise to use a fiscal year corresponding with the annual cycle of business operations. The ideal year would end at the low point of receivables, inventories, and loans, rather than at the end of a calendar year. At this point, a dispute over such matters as the value of inventories is less likely. If such a change is made, time it carefully so that there will be no adverse tax effects during your changeover period.

THE END

Slings and fittings

■ An 80-page catalog from the Wire Rope Corp. of America illustrates and describes 54 Wireco sling types and the most commonly used fittings. Capacity tables accompany illustrations of each sling and fitting. Details on the Mazzella multipart slings are included.

To obtain this catalog write to Wire Rope Corporation of America, St. Joseph, Mo., or use the Request Card at page 18. Circle No. 8.

Earth-boring machines

■ A catalog from Sterling Engineering & Mfg. Co., Wilkes-Barre, Pa., gives the complete specifications and outstanding features of the Model A and the Enterpriser earth-boring machines. Both models are hydraulically controlled.

To obtain this catalog write to the company, or use the Request Card at page 18. Circle No. 10.

Heavy-duty compactor is easily maneuvered

■ A new design in heavy-duty pneumatic-tire road compactors is announced by Seaman-Andwall Corp. The new S-A self-propelled compactor is capable of road speeds up to 20 mph for easy transport to the job.

Equipped with power steering for easy maneuverability, the 5-to-20-ton unit easily makes a 180-degree turn on a 20-foot roadway, according to the manufacturer. Nine pneumatic-tire wheels on the rear and eight on the front carry pressure "straight down," even in turning, thus eliminating pushing action, surface shear, scuffing, and material displacement.

Four 500-gallon compartments for



The new heavy-duty compactor made by Seaman-Andwall Co. of Milwaukee, Wis., in position for a full 180-degree turn.

liquid or sand ballast allow wide variation in road weight from 5 tons empty weight to 15 tons with water or 20 tons with sand ballast.

For further information write to Seaman-Andwall Corp., 282 N. 25th St., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 36.

GULF PRODUCTS and FINE SERVICE

keep equipment rolling

on Schuylkill River Expressway Project



Lipsett, Inc., New York, New York has the contract for the Schuylkill River bridge and its approaches for the Schuylkill River Expressway, which will connect with the Pennsylvania Turnpike near Philadelphia, Pennsylvania. Gulf products are keeping this contractor's modern equipment operating efficiently on the job.

IT'S a faster, smoother job when equipment delivers top performance—and the use of quality petroleum products is one of the best guarantees of that kind of performance.

That's why leading contractors, like Lipsett, Inc., select Gulf as their supplier. They have found that Gulf quality lubricants and fuels provide an extra margin of protection against mechanical delays . . . and they appreciate Gulf's prompt delivery service and helpful petroleum engineering counsel.

Send the coupon below for your copy of our new brochure, "Gulf and Your Business."

Gulf Oil Corporation • Gulf Refining Company
1822 Gulf Building,
Pittsburgh 30, Pa.



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Gentlemen:

Please send me a copy of your new brochure, "Gulf and Your Business."

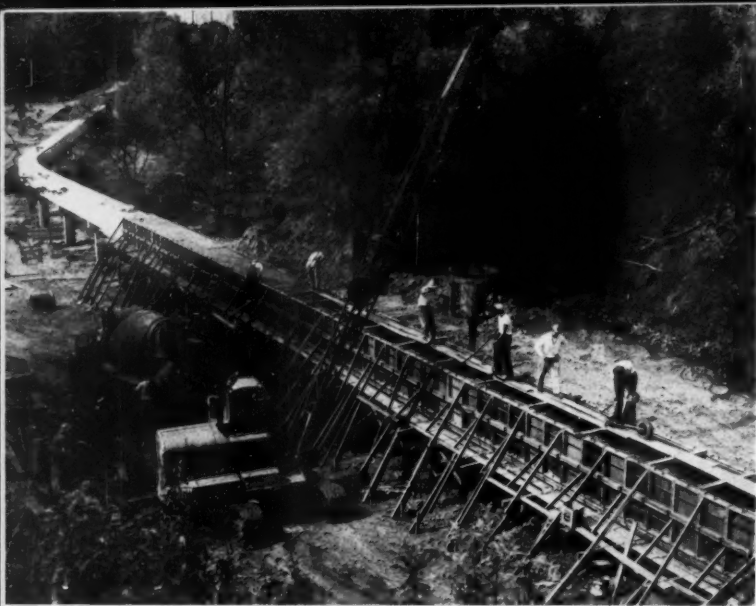
Name.....

Company.....

Title.....

Address.....

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 260



A Unit crane buckets concrete from a Willard mixer to the 4-foot 3-inch wide and 4-foot high forms, which are held by Symons column clamps. The aqueduct, weighing more than 1 ton per linear foot, is supported by heavy bracing during a pour.

Small concrete aqueduct supports new sewage line

Pipelines have replaced the old Roman aqueduct, but both, used together, solve a job's cost problem

The job of extending a 27-inch pipe 525 feet across a broad ravine to a sewage-treatment plant without allowing the line to pitch more than 1 inch per 100 feet could have been done by building a fill to create a long, gentle slope to support the pipe. But this costly work on the Streator, Ill., plant was ruled out when architects Warren & Pragg, Decatur, Ill., designed an aqueduct, with supporting concrete piers spaced 25 feet apart, to contain the vitrified tile pipe. The structure is 4 feet 3 inches wide and 4 feet high.

While this solved the cost problem, it did not eliminate all construction difficulties. The pipe alone weighs 225 pounds per foot. With concrete poured around the pipe, the structure has a total weight of more than 1 ton per linear foot. All this weight had to be supported on the relatively soft ground in the ravine.

Footings and bracing

Central Ironite Waterproofing Co., Maywood, Ill., general contractor on the work, turned over the job of setting up concrete pours around the pipe to the engineering department

of Symons Clamp & Mfg. Co. Bob Porter, over-all manager, and Bill Cody, superintendent for the contractor, worked closely with Eric Plane, the Symons on-the-job representative, during actual construction of the aqueduct.

Footings measuring 7x7 feet, and 1 foot 3 inches in thickness, were built first, since the soft ground was unable to support the heavy weight of both pipe and concrete. Piers for the aqueduct, 12x24 inches at the base, 12x48 inches at the top, and from 10 to 19 feet high, were poured in one lift in forms held by Symons column clamps.

The sides of the aqueduct, supported by one set of wales, were formed with Symons standard steel cross-membered panels and 51-inch ties. Extensive bracing was used to prevent the structure from tipping.

The 3/4-inch plywood forming the beam bottom rested on 4x4-inch joists. Girths, 4x6 inches and spaced every 4 feet, were supported by Symons safety shores, which were assured of a firm footing in the soft ground by pilings driven for this purpose.

THE END

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... to Make Your Concrete Gunning EASIER... MORE EFFICIENT... MORE PROFITABLE!

Whatever your concrete gunning requirements, now there is an AIRPLACO concrete gun sized just right to meet your specific needs, from 1/2 to 7 cu. yds. per hour.

BONDACTOR MODEL 750 — Capacity of 1/2 to 3/4 cu. yd. per hour. Operates with 75 or 125 CFM compressor.

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BONDACTOR MODEL 1250L — Capacity up to 3 cu. yds. per hour. Operates with 210 CFM compressor.

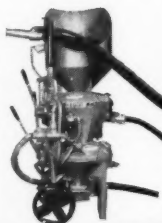
NUCRETOR MODEL 1500S — Capacity up to 3 1/2 cu. yds. per hour with 250 CFM compressor and 1 1/4" placement hose, or up to 5 cu. yds. with 315 CFM compressor and 1 1/2" hose.

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Capacities will vary with materials being gunned and with operating conditions.



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BONDACTOR MODEL 1250S

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Here is real portability, efficiency and economy. The AIRPLACO rig consists of the AIRPLACO Bondactor or Nucleator (Nucleator shown in photo) . . . the automatic proportioning, mixing and elevating MIX ELVATOR . . . and the new AIRPLACO Sand Loader. This completely mobile unit moves easily and quickly from one job site to the other and out-performs all other methods for profitable concrete construction, maintenance or restoration.

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WHY LUFKIN CHROME CLAD TAPES last longer



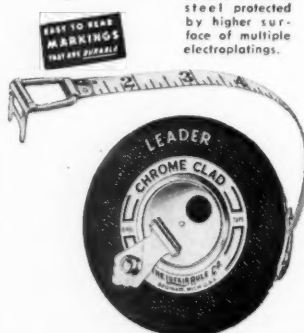
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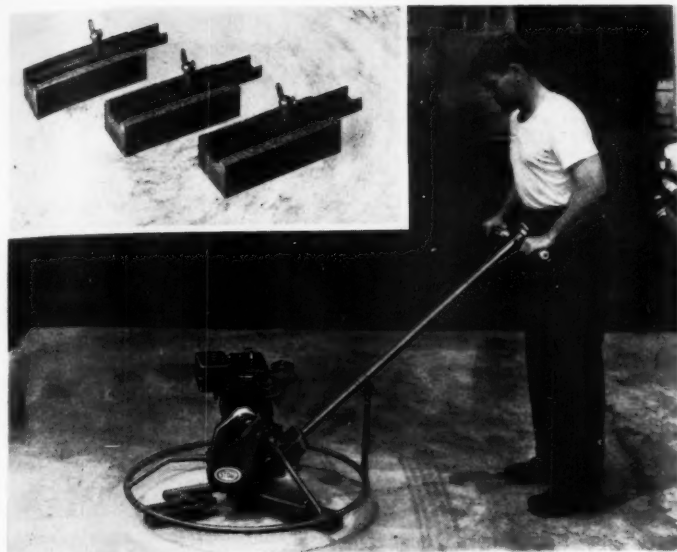
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CONTRACTORS AND ENGINEERS



Grinding blocks attach to the Stow G34 Roto-Trowel for rubbing down seams between concrete slabs or for extra-fine finishing.

Concrete-grinding blocks attach to rotary trowel

Grinding blocks which can be attached to the G34 Roto-Trowel are being marketed by the Stow Mfg. Co. These blocks, which are 2x3x8 inches, can easily be attached in place of the trowel blades with just a wing nut.

Made of No. 24 grit, the blocks are perfectly flat so that the entire bottom surface is in contact with the concrete. The G34's 2½-hp motor drives the blocks at speeds as low as

25 revolutions per minute.

These rotary grinding blocks are used to rub down the seam between concrete slabs or to obtain an extra-fine finish on any flat surface. They can be used both for dry grinding or, at slower speeds, for wet rubbing.

For further information write to Stow Mfg. Co., 40 Shear St., Binghamton, N. Y., or use the Request Card that is bound in at page 18. Circle No. 37.

Clark Equipment forms international subsidiary

A new subsidiary organization to consolidate export functions of the firm's divisions throughout the world has been formed by the Clark Equipment Co., Buchanan, Mich. The new corporation will be known as the Clark Equipment International, C. A., and is being organized under the laws of Venezuela.

In addition to centralizing present export operations, the new subsidiary will promote new markets for material-handling industrial trucks, construction machinery, and heavy automotive equipment. It also will supervise Clark licensees and companies abroad and will handle distributor sales abroad.

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Get the wrecking power you want *exactly where you want it* with Frederick Drop Balls . . . tough, low cost production tools that stand up under constant punishment, with almost no maintenance. Extra durable nickel alloy is standard in all balls 4000 lbs. or over—or, we'll be glad to quote on special alloys if desired. Frederick's exclusive "Pear-shape" design drops straight—swings true—withstanding greater impact . . . "E-Z Swing" steel eye is recessed to give cable protection plus free-swinging action. Balls can be furnished with replaceable pins, if requested. Also available are special release hooks for free dropping.

Wide range of sizes and weights:						
Pear shape (lbs.)	1500	2000	3300	4000	5200	8000
Ball shape (lbs.)	500	1000	2000	5200		
Spherical shape (lbs.)	470	950	1650	2400	3000	3700 5400 (for magnet use)

Write us today for prices and illustrated literature. Order Balls direct or from your Equipment Dealer.

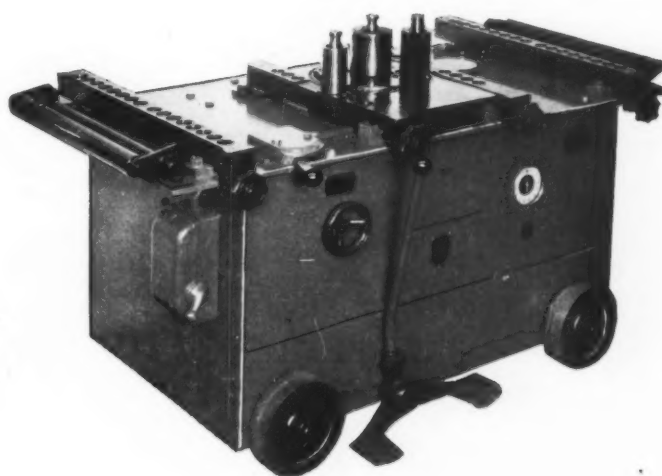
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 263
FEBRUARY, 1956



NEW ABRASION-RESISTANT, Koroseal-coated canvas gloves manufactured by the Goodrich Co. are recommended for workmen handling concrete rubble or broken brick, which scrape and grind conventional protective gloves. The gloves are useful wherever extra toughness is needed for handling abrasive materials. The Koroseal surface also protects against acids, caustics, petroleum, and mineral oils, according to the company. For further information write to the Industrial Products Division, the B. F. Goodrich Co., Akron, Ohio, or use the Request Card at page 18. Circle No. 99.

Automatic . . . Bar Bending Machine



This new Bending Machine features all the latest improvements called for in modern fabricating methods. Right and left-hand bends can be made without additional adjustment by means of a single control lever.

The variable speed drive is easily adjustable to suit any thickness of material assuring high operating efficiency even when handling light stock.

Automatic stop and return control provides maximum safety and uniform work.

Special attachments permit the bending of hooks and angles on slab, truss or offset bars. Also will bend spirals, rings and curves of any diameter and pitch.



Stirrup Bend



Spiral Bend



Large Double Bend



Multiple Double Bend



KLINGELHOFER

MACHINE TOOL COMPANY
Sole Distributor
Industrial Park Kenilworth, N. J.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 264

New highway line marker with automotive steering

■ A new self-propelled highway line marker which paints either solid or intermittent lines has been announced by the M-B Corp. Among features of this machine previously found only in larger, higher-priced models is automotive-type steering, which gives the three-wheeled unit good maneuverability and eliminates the necessity of skid-steering for a perfect curve.

The new LineMaster is one-man operated, and travels at a speed of from 3 to 5 mph. A sturdy operator's platform is always in line with the paint guns and stripes, thus making retracing easier. The 18-gallon paint tank is said to give 50 percent greater



The M-B LineMaster features automotive steering and a larger paint tank.

paint capacity than comparable machines. Paint guns are standard, air-operated, and easily visible to the operator while marking.

The unit has ample power and air reserve for continuous double-line work, marking lines from 3 to 6 inches wide, regular or reflective,

solid or intermittent.

For further information write the M-B Corp., 1635 Wisconsin Ave., New Holstein, Wis., or use the Request Card at page 18. Circle No. 31.

Spring suspension mount for vibrating screens

■ An optional secondary spring suspension designed to eliminate transfer of vibration, increase freedom of screen motion, and reduce strain on moving and structural parts has been developed for its larger screens by Pioneer Engineering Works, Inc.

Consisting of four heavy coil springs; one in each corner of the main frame, the new mounting floats the weight of the entire screen and frame. Transfer of vibration to the supporting structure, which inevitably occurs to some degree on large vibrators, is thus virtually eliminated; motion of the screen pan is less restricted than it would be by rigid mounting of the main frame to the supporting structure; and strain on both moving and structural parts is reduced, the moving parts having more freedom for motion and the support structure having greatly reduced and weakened motion to resist.

Another advantage in the new mounting is that the rear (receiving end) of the mounting framework has been designed to facilitate installation of conveyor supports.

For further information write to Pioneer Engineering Works, Inc., 1515 Central Ave., N. E., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 43.

Low ground bearing pressure in backfiller

■ A new, wider backfiller, the Model 80W, has replaced the Model 80 in the line made by The Cleveland Trencher Co., Cleveland 1, Ohio. Though it weighs 11,500 pounds, about 1,500 pounds more than the original machine, the new model has a ground bearing pressure of 4.5 psi as compared to the 7.2 psi of the older model. This is due to the bigger over-all width of the new model—6 feet 3 inches—and the 16-inch-wide crawler pads. The older model had pads 10 inches wide. The side crane capacity of the backfiller is 25,000 foot-pounds as compared to the 18,000 foot-pounds of the Model 80.

The tamper unit available for the older model is available for the Model 80W with an additional 2-foot tamper boom extension that adds to the side reach of the machine when it tamps wide trenches. The tamper unit can now be started electrically from the operator's seat.

For further information, write to the manufacturer, or use the Request Card at page 18. Circle No. 96.

Jaeger Machine Co. news

J. D. Anderson has become general sales manager of the Jaeger Machine Co., Columbus, Ohio, succeeding J. H. Yearling. Mr. Yearling is now director of market promotion.

TORRINGTON SPHERICAL ROLLER BEARINGS



"This flange guides the rollers to peak performance!"

The center flange on the inner raceway of the TORRINGTON Spherical Roller Bearing positions the rollers to handle thrust loads. This accurate positioning also assures radial stability of the rollers under heavy loads—even at continuous high speeds and under conditions of misalignment.

This superior design feature is only one of many advantages you get when you specify TORRINGTON. For example, you get the service of TORRINGTON's experienced engineers, who will help you with design and maintenance problems—or design custom bearings for special applications.

For long, low-maintenance service in heavy-duty applications, order TORRINGTON Spherical Roller Bearings. They're available from stock with either straight or tapered bore, for shaft or adapter mounting.

THE TORRINGTON COMPANY
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District offices and distributors in principal cities of
United States and Canada



TORRINGTON BEARINGS

Spherical Roller • Tapered Roller • Cylindrical Roller
Needle • Ball • Needle Rollers

For more facts, use Reader-Reply Card opposite page 18 and circle No. 265

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The throttle valve on the new
model is hydraulically operated.
For further information write to
The Salem Tool Co., S. Ellsworth
Ave., Salem, Ohio, or use the Request
Card at page 18. Circle No. 38.

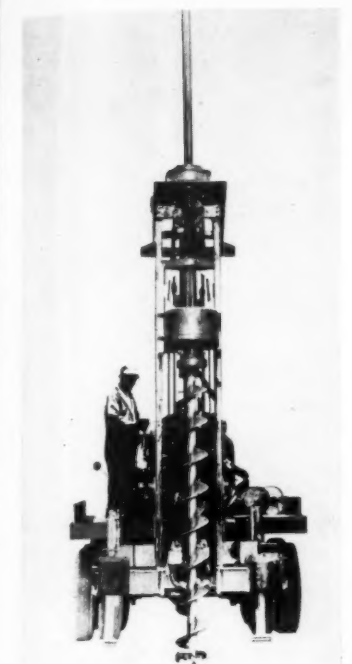
Heavy-duty pipe vise
for outdoor use

New to the contracting field is a
150-pound vise of semisteel construc-
tion suitable for bending heavy iron
bars and other heavy-duty work.
Made by Athol Machine & Foundry
Co., Athol, Mass., the vise has jaws
with 5 x 4-inch gripping surfaces.

A full 5-inch-long pipe grip, which
will hold 1/8 to 6-inch diameter pipe, is
built into both sides of the jaw facing.

The top of the jaws provides an
area large enough for riveting. Ac-
cording to the manufacturer, the vise
can be left outdoors without being
damaged.

For further information, write to
the manufacturer, or use the Request
Card at page 18. Circle No. 94.



The new McCarthy 106-24 vertical drill
uses augers of from 24-inch diameter
down.

Up to 24-inch augers handled by new drill

The new Model 106-24 vertical
auger drill announced by The Salem
Tool Co. combines a capacity for
augers of up to 24-inch diameter
with efficient operation of normal 8-
inch (and smaller) augers used in
blast-hole and foundation drilling,
dewatering, and other heavy-duty
drilling operations.

The new McCarthy drill has two
output shafts—one running at nor-
mal speed for augers up to 8 inches
in diameter, and the other running at
speed suitable for 12 to 24-inch-di-
ameter augers. An auxiliary speed-
reducing unit, integral with the trav-
eling carriage, reduces rotary speed
and increases torque when the unit
uses augers larger than 8 inches in
diameter. Drilling depth then de-
creases as larger diameter augers are
used.

The throttle valve on the new
model is hydraulically operated.

For further information write to
The Salem Tool Co., S. Ellsworth
Ave., Salem, Ohio, or use the Request
Card at page 18. Circle No. 38.

Heavy-duty pipe vise for outdoor use

New to the contracting field is a
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Made by Athol Machine & Foundry
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A full 5-inch-long pipe grip, which
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The top of the jaws provides an
area large enough for riveting. Ac-
cording to the manufacturer, the vise
can be left outdoors without being
damaged.

For further information, write to
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Card at page 18. Circle No. 94.



THE NEW ROCKET 65, a versatile 6 1/2
to 7-yard truck-mixer, is equipped with
a hydraulically operated chute control
with a permanently attached "flip-flop"
chute. A heavy-gage, lightweight alu-
minum detachable extension chute and
an electric revolution-counter kit are
also standard equipment. Available in
3, 3 1/2, 4 1/2, and 5 1/2-yard models, the unit may be had with a choice of industrial engines.
For further information write to the Concrete Transport Mixer Co., St. Louis, Mo., or use
the Request Card at page 18. Circle No. 121.

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All across the country you'll find GALION
Graders giving unsurpassed performance
and service — on all kinds of terrain under
all kinds of working conditions. The ground
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miles of work accomplished per day. Write
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Greatly increases maximum extension of
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more miles of work per Galion Grader.

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MOTOR GRADERS • ROLLERS

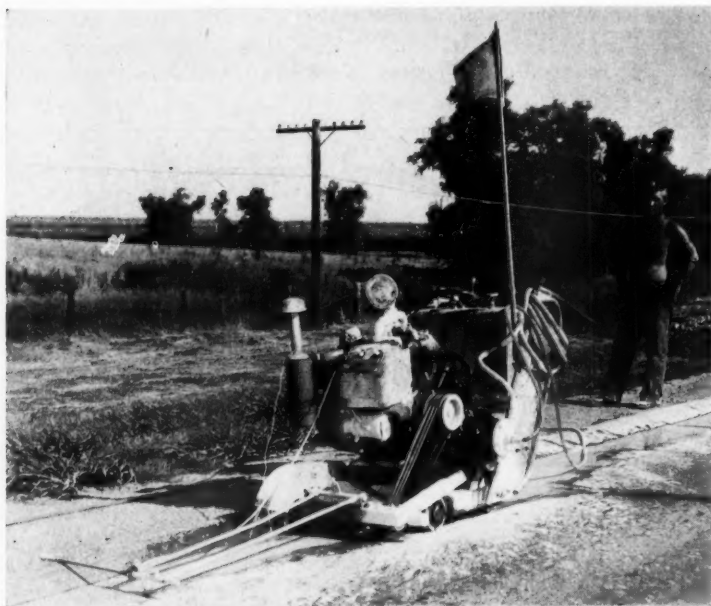
TRENCH ROLLERS PORTABLE ROLLERS 3-WHEEL ROLLERS TANDEM ROLLERS MOTOR GRADERS
THE GALION IRON WORKS & MFG. CO., General and Export Offices, Galion, Ohio, U.S.A.
Cable address: GALIONIRON, Galion, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 266

Slip-form paver proves fast, economical road widener

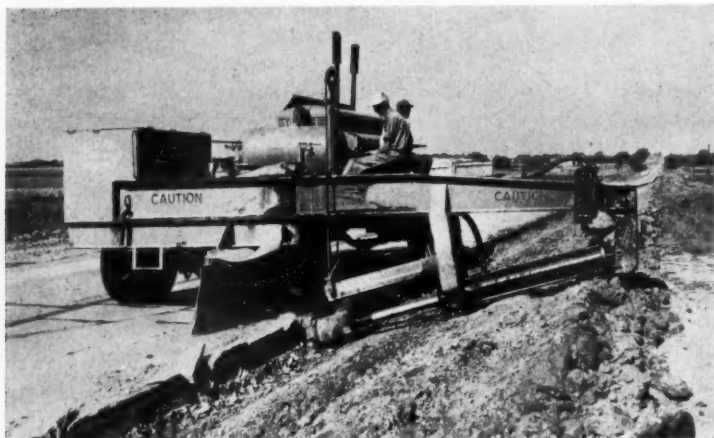
by RALPH MONSON, field editor

Special machines break up lip curbs and excavate trenches; use of open dump trucks to haul wet concrete adds to economy



1. The first step in removing a lip curb is handled by a Clipper ConSawMatic with a diamond-edge blade. The self-propelled rig moves along, making a cut at least 1½ inches deep at the inside edge of the curb, while the operator watches.

C&E Staff Photos



2. A pneumatic breaker, designed by the highway department, knocks off the lip curb. A Jaeger compressor at front operates both the air motor propelling the machine and the air ram driving the hammer, which strikes about 2 inches below the curb.



3. As soon as the breaker has passed, Booth & Olson, Inc., Sioux City, Iowa, scoop up the broken concrete. A Hough Model HR Payloader loads it into a Studebaker dump truck for disposal.

Slip-form pavers, capable of placing 10,000 linear feet of 3-foot concrete pavement per day for a widening job, were responsible for the 376 miles of road widened last year in Iowa. But for the shortage of cement, the total would probably have been even greater. Roughly 240 miles of the work has been held over until this season, when the Iowa State Highway Commission plans to let an additional 500 miles for widening.

Prices for the work under competitive bidding range from a low of about \$3.90 per square yard to \$4.50. In many cases, the costs compare favorably with those of regular concrete paving, so that the state is not paying a great penalty for having built narrow pavements in the first place.

The clue to these economical jobs seems to lie in the use of the slip-form paver, an adaptation of the Blaw-Knox (Apsco) widener. This machine, riding on the old pavement, transfers concrete by belt from standard dump trucks to a prepared trench. Then components of the machine strike off, vibrate and screed the concrete as the machine moves along.

Despite the high-speed formless placing method, the widening strips have riding qualities at least as good as those of the adjacent old slabs. All the sections widened last year were those having old concrete slabs generally in good condition and on satisfactory grades and alignment. Broken or deteriorated concrete was repaired before the 3 or 2-foot widening sections were put down to bring the old 18 or 20-foot pavements to a 24-foot width. All work is being made as inconspicuous as possible so that drivers will use the wider roadways as they were a single slab. Unlike most previous jobs, the concrete widening done in Iowa gives the road a finished wearing surface. The state does not plan to do any bituminous recapping for a number of years.

Removing lip curbs

Typical of the jobs was that done by Fred Carlson Co., Inc., Decorah, Iowa, on about 24 miles of U. S. 20 and State Route 69, south and west of the junction of the two roads. Another was the work on U. S. 18 and U. S. 63, done by Booth & Olson, Inc., Sioux

City, Iowa. Both contractors placed an average of 6,000 to 7,000 linear feet of 3-foot widening slab per 11 or 12-hour day. Before moving to its new job, this Booth & Olson crew finished a 31-mile project in 45 days. Another crew working for this contract, but using a larger paver, was reported to have placed up to 10,000 linear feet in a single day.

In some sections, the old roads had integral lip curbs that reduced the usable width of the pavement to as little as 16 feet. These were removed before any widening work was done. The first step in this operation was started when a saw cut was made along the inside edge of the lip curb by a Clipper ConSawMatic. This self-propelled concrete saw used diamond-edged blades. Although the lip curbs were 12 inches wide, the contractors chose to saw 13 inches in from the edge of the slab. At this point, the saws operated far enough away from the irregularities at the junction of the slab and curb. Sawing was done well in advance of other work, causing little inconvenience to motorists.

The lip curb was broken off by a special machine designed for this purpose by the state highway department. One of these machines, owned by Hallett Construction Co., Crosby, Minn., was used on both jobs.

Before the breaker arrived on the job, Caterpillar No. 12 motor graders bladed dirt away from the shoulder, making a V-cut to remove dirt almost to the bottom of the slab and depositing the material out on the shoulder. Then the breaker moved in. Though strange looking, the breaker is an efficient self-contained machine, mounted on a truck chassis. At the front is a Jaeger 375-cfm air compressor driven by an International UD-18 diesel engine. An air motor propels the truck, and a creeper gear provides a very slow speed for working. At the rear of the chassis is a hinged cantilever arm or outrigger that extends over the shoulder of the road when the rig is working and folds against the side of the truck when the machine is being moved.

Suspended from the outrigger is an air ram with a heavy hammer attached to its piston rod. Special renewable chisel bits are inserted in the



4. Workmen with Thor hammers powered by two Le Roi 110-cfm compressors break off projecting concrete. Trimming is required so that at least 1½ inches of new concrete will be placed in the area formerly occupied by the lip curb.

hammer, which is guided to strike the edge of the slab about 2 inches below the base of the lip curb.

Two men operate the breaker, one steering the truck while the other operates valves and levers controlling the air ram and the propelling motor. Under normal operating conditions, the breaker removes up to 8,000 linear feet of curb in a 12-hour day.

As the breaker's chisel-edged hammer struck the edge of the slab, making an almost clean break from the bottom of the saw cut to the edge of the pavement, broken concrete was loaded into dump trucks by a Hough Payloader and hauled to a waste pile.

A certain amount of hand trimming had to be done, since specifications required concrete to be broken off at least 1½ inches below the top of slab grade and the breaker left some projections sticking up higher than this. Booth & Olson did this work with Thor breakers powered by a pair of Le Roi 110-cfm compressors. An air blast cleaned off the last of the loose material after the hand chipping was finished.

Specifications also required that work be done only along one side of a road at one time, making it necessary

for the breaking machine to visit each job at least twice. Contractors were not permitted to disturb the opposite side of the pavement until concrete had been placed for the first side.

In addition to removing the lip curbs, contractors had to remove the accompanying concrete flumes and extend some of the culverts. In a typical operation, flumes were broken up by a Schield Bantam crane equipped with a breaker ball, and broken concrete was removed and loaded into trucks by a Gradall.

Preparing the trench

Two Caterpillar No. 12 motor graders teamed up to prepare the trench for the 10-inch-thick widening slab. One of the graders used its regular blade and scarifier to remove much of the shoulder material. The second grader was fitted with a Domor coring-out attachment designed to produce the trench desired. This rig made one or two passes to complete the trench, depending on the type and amount of material to be moved. On the final pass, a workman accompanied the grader, checking the trench, depending on the type and amount of material to be moved. On the final pass, a workman accompanied the grader, checking the trench with a template. The template insured that the trench was of the



5. The widening trench is cut to exact depth by a Domor coring attachment on a Caterpillar No. 12 motor grader. Using a template, a workman makes sure the trench provides for the normal crown of the pavement.

proper width and full 10-inch depth and that it had the proper slope to compensate for the crown of the pavement. The trench was then rolled by a C. H. & E. Model 3BA tandem roller, or another narrow roller, to assure subgrade compaction.

All material excavated from the trench was bladed out onto the shoulder where it was out of the way until it was needed for reshaping. Finally, the old pavement was carefully cleaned along the edge to provide the best possible surface to guide the screed of the paver.

Dump trucks haul concrete

Both contractors mixed concrete in standard paving mixers located near the middle of the job, then hauled the material from the mixers to slip-form pavers in open dump trucks. This method had a number of advantages over that of using a regular paving mixer on the road.

In the first place, the rubber-tire Blaw-Knox (Apsco) wideners could move down the road faster than a track-type paver could travel while working. If concrete was supplied to the wideners fast enough, their laying speed was not limited, as it would

be if a crawler paver were used. The paving method also caused less obstruction on the road than a paver and its auxiliary equipment, making it easier for the road to handle traffic while the job was in progress. A third advantage was that the paver operator had to be concerned only with the charging and mixing cycles, and did not have to move the machine. This allowed the pavers to produce more concrete per day than could have mixed on the road.

On the Carlson contract a Koehring 34-E Twinbatch paver, its boom and bucket removed, was set up at the junction of U. S. 20 and State Route 69. Materials were dry-batched from a plant at Blairsburg about two miles from the mixer. Here a Koehring 304 crane with a Blaw-Knox 1-yard clamshell charged coarse and fine aggregates into a Blaw-Knox 2-compartment bin. Batches were weighed out to a fleet of seven trucks hauling to the paver. A Johnson transfer plant, working directly from the bulk cement cars, proportioned cement to the batches. Water was hauled to the mixer by three Ford trucks carrying 1,000-gallon tanks.

A depressed roadway was con-



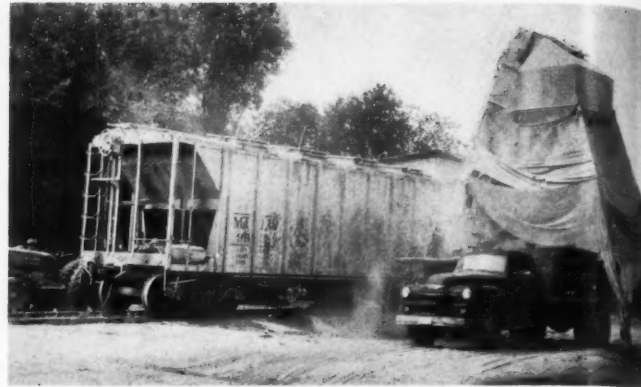
6. Subgrade paper, required under concrete by Iowa, has been placed. A dump truck delivers concrete to the Blaw-Knox (Apsco) widener, which spreads the material in the trench. The slip-form paver attachment has a strike-off, vibrator, and screed for finishing concrete.



7. Aside from this hand edging of the outside edge, a minimum of hand finishing is done behind the burlap drag of the paver. This machine, used by Fred Carlson Co., Decorah, Iowa, uses both Maginniss Hi-Lectric and Mall vibrators.



◀ At Booth & Olson's dry batch plant, a Koehring 304 crane with an Owen 1¼-yard clamshell charges the Johnson two-compartment bin with sand and coarse aggregate. C&E Staff Photos



▲ A Johnson cement transfer plant, working directly from railroad cars near the aggregate bins, moves cement through the scales to a Chevrolet batch truck being used by Booth & Olson.

(Continued from preceding page)

structed near the mixer so that wet-batch trucks would be low enough to discharge the mix directly into the dump boxes of the trucks. Two 37.4-cubic-foot batches were hauled by each truck. Fourteen trucks, covering near-maximum haul distances, brought material from the mixer to the paver on the road. Carlson operated 17 International trucks on the wet and dry-batch hauls, renting additional trucks as necessary.

Booth & Olson used a similar setup. This firm's mixer, a Koehring 27-E single-drum machine, was set on an elevated platform adjacent to the dry-batching plant. Trucks were charged with aggregate from a Johnson two-compartment bin charged by a Koehring 304 crane with an Owen 1¼-yard clam. Cement was handled directly from cars to batches by a Johnson cement transfer plant.

Dry-batch trucks backed up an incline to dump into the skip of the paver. From its elevated position, the paver discharged directly into the boxes of the fleet of wet-batch trucks. Three 29.7-cubic-foot batches were carried in each truckload. This operation required four dry-batch trucks and 11 trucks for hauling mixed concrete.

Concrete finishing

Waterproof subgrade paper, required under all concrete pavements on Iowa highways, was rolled out in the trench ahead of the paver as concrete work started. Concrete from the wet-batch trucks was then dumped into the hoppers of the Blaw-Knox wideners. Both Carlson and Booth & Olson used Blaw-Knox (Apsco) wideners, units which operated on the old pavement. The slip-form and concrete-finishing equipment was attached to the side of the wideners.

Concrete was taken by belt from the hopper of the machine to the trench, and as it was deposited on the subgrade paper, a reciprocating strikeoff spread the material to fill the trench and strike it off at proper grade. Maginniss and Mall vibrators helped consolidate the mix.

A wide, flat steel finishing screed, measuring about 3 or 4 feet, and riding on the outer form of the machine



**Gets back
on new slab
sooner**

speeds paving schedules

KOEHRING 16-E *twinbatch*®

paver on rubber tires is as mobile as your batch trucks. It works on or off-pavement — can get back on new slab in as little as 7 days to pave adjoining highway strips, scattered intersections, approaches to driveways and side roads. This time-saving "run-about" makes self-powered moves at 9 m.p.h. Yet, for all its mobility, the Koehring 16-E *twinbatch* is primarily a production paver — exceeds the output of large single-drum pavers on main highway work. For instance —

On straight-production paving, the Koehring 16-E hits a top output of 86.7 batches an hour (based on 60-second mixing cycle). This reserve production capacity with *twinbatch*

Autocycle mixing offsets normal job delays — lets you pick up lost time which cannot be made up with a limited production single-drum paver.

Averages 50 cu. yds. an hour

As a result, the Koehring 16-E *twinbatch* easily maintains an average of over 76 batches an hour — 8 hours a day. Based on 16 cu. ft. per batch, plus the usual 10% overload, this assures you 50 cu. yds. of concrete per hour — with a small crew — on your main-highway paving jobs.

While its usefulness is unlimited as a general-purpose paver, this versatile Koehring 16-E also serves as a mobile concrete mix plant. On construction of curbs, gutters, culverts,

bridges, pilings, it discharges into overhead hoppers, forms, chutes, or loads trucks. Elevating boom reaches up and out 60° — gives controlled discharge at 21-foot height (higher with special boom).

See for yourself how the big production capacity, overall versatility, and rubber-tired mobility of this Koehring 16-E *twinbatch* can put you miles ahead on your paving schedules. Get all the facts from your Koehring distributor, or write us for 16-E catalog. Big 34-E *twinbatch* is also available for major highway, airport paving.

KOEHRING Company
Milwaukee 16, Wisconsin

(Koehring Subsidiaries: JOHNSON • PARSONS • KWIK-MIX)

CONTRACTORS AND ENGINEERS

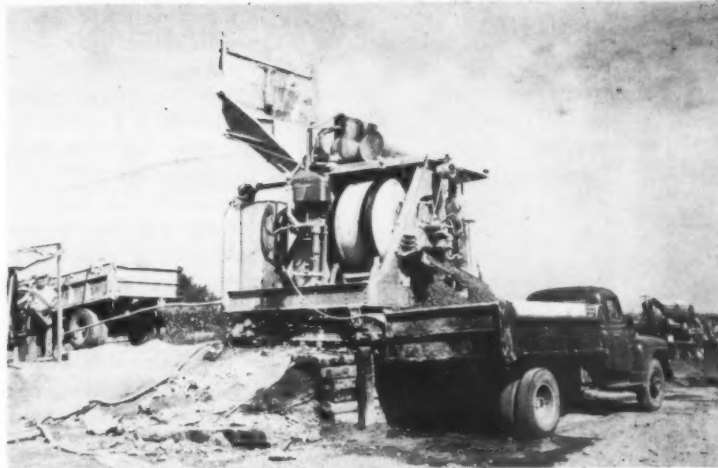
and on the old pavement, next moved over the fresh concrete. This screed was heavily weighted to keep it down to proper grade. Behind the screed, a burlap drag applied the finish to the concrete.

In areas where the lip curb had been removed and new concrete was being placed over the old slab, the old concrete was given a preparatory treatment ahead of the paver. All dirt and loose or foreign material was first carefully removed, the slab was wet thoroughly, and cement was spread on the wet slab and carefully brushed into all irregularities in the surface. Then the finishing machine passed by, placing the thin concrete overlay in precisely the same way as the widening strip.

Crews of both contractors held

hand finishing to a minimum. It was necessary to edge the outside corner by hand and to place $\frac{1}{8} \times 2$ -inch bituminous strips across the widening slab in line with expansion joints in the old pavement. These operations, and a small amount of touching up on rough spots and the joint between the old and new concrete, were all that were required.

Newly placed concrete was covered with burlap as soon as possible and kept wet until the next day. Then the surface was sprayed with curing compound. Booth & Olson used Protex clear curing compound, which was applied by a power pump and hand spray. An improvised two-wheel cart was used to carry the pump and motor; together with the barrel of curing compound. Mounted on large rubber-



Similar to the Carlson setup is this used by Booth & Olson at the dry-batching yard. The Koehring 27-E single-drum paver is set on a platform so that trucks can be loaded at grade. Here a Chevrolet truck delivers dry batches to the paver while an International picks up mixed concrete.

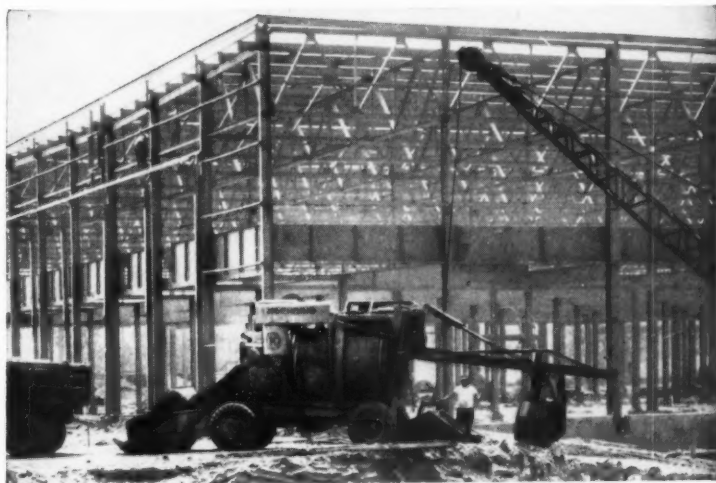
Big rubber-tires are easy on the sub-grade

Notice how there's little or no scuffing on the sub-grade with a Koehring rubber-tired 16-E paver. When working between forms, flotation of the big 11:00 x 20 pneumatic tires protects the grade against surface damage — saves unnecessary filling and re-leveling. This rubber-tired advantage also lets the Koehring 16-E twinbatch work on pavement without planking to pour adjoining slabs, widen highway and airport strips, pave intersections, pour concrete for curbs, gutters, culverts.



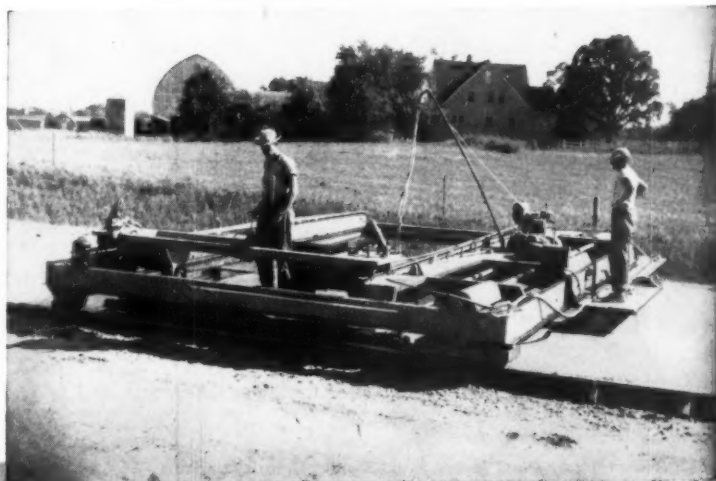
Mobile 16-E paver serves as a concrete mix plant

On building construction, versatile Koehring 16-E twinbatch pours footings, floors, columns — is never "grounded". Power-controlled boom swings in a 160° arc, or elevates 60° for overhead discharge — locks and holds in any position. Controlled-discharge bucket dumps anywhere along the 25-foot boom, can be opened or closed at any time for gradual discharge. Water-level capacity of bucket is 24 cu. ft. That's more than ample capacity to hold the full 16 cu. ft. batch of concrete, plus 10% overload.



Precision finisher keeps up with any paver

"Timely", precision-finishing is important on any paving job. Operating at almost twice the speed of a 34-E paver, Koehring Longitudinal Finisher handles all practical consistencies of concrete—harsh, wet or dry. It overcomes slump difficulties on grades and elevated curves. Produces mechanically accurate concrete slab surface, 8 to 30 feet wide, with uniform crown transitions.



tire wheels, this cart was easily pushed along by one man, while another handled the spray.

Finish is checked

On the morning after concrete was placed, a rolling straightedge was used on the entire pour so that irregularities of more than $\frac{1}{4}$ inch, either up or down, could be detected in the 10-foot span. Spots failing to pass this test had to be ground to remove the high points. Only in a few instances was this work necessary.

In working along one side of a road, the contractors had to leave out sections at farm driveways and crossroads. Wood headers were inserted at these points. As soon as concrete had cured sufficiently so that it could be used by traffic, cross-traffic was routed over the new concrete, and the space that had been skipped was filled by hand methods. This provided a good fill-in job when weather conditions or other circumstances held up regular operations.

Joints were filled with Kapco rubber-asphalt joint-sealing compound, applied hot. On early jobs, the joint between the old and new slabs was first carefully edged as concrete was being placed, then filled with the joint sealer. This edging was discontinued later so that the widening strip would be as inconspicuous as possible.

When paving had been completed on one side of a road, the shoulder was reshaped with the material that had been bladed out to form the widening trench. Taking three feet off a shoulder to widen a road actually left many of the shoulders narrower than is desirable, but because of the urgency of the widening program, the regrading of shoulders is being delayed a few years.

Another phase of the program—widening of bridges and culverts—is also under contract, and is being carried on simultaneously with paving work. Bridge widening is proceeding at a slower pace, and there are many places where the widened portion of a road stops at one side of a narrow bridge and picks up again on the other side. These breaks in the pavement will be filled in as the structures are widened.

When this program started, the



state had an estimated 2,000 miles of pavement adapted to this type of widening. With the work done during the 1955 season, and the increased production planned for this year, the state should have more than half the total mileage widened by the end of 1956.

Personnel

One of the most active promoters of the program is construction engineer C. L. Gleason of the Iowa State Highway Commission. He has been instrumental in the development of the machine for breaking off lip curbs and in changing specifications so that slip-form pavers can be used on the work and open dump trucks used for hauling concrete. These two things have made it possible to widen roads

without interrupting traffic, and to get the job done economically.

The resident engineer for the Iowa State Highway Commission on the Carlson contract was E. L. Morris, and the chief inspector was C. M. Craig. This job was done under the jurisdiction of the Ames District, which has W. W. Wickham as district engineer. On the Booth & Olson project, G. W. Fiddick was resident engineer and Walter Schnurr and Kenneth Huber handled field inspection. The work was under the Mason City District, having R. R. Zack as district engineer. John G. Butter is chief engineer of the Iowa department.

George Sellman and Russell Chism were superintendents of field crews for Fred Carlson Co., while Orlando Quam supervised operations at the

plant. Superintendent Don Murfield was in complete charge of work for Booth & Olson, Inc. THE END

Engine-hour meters

A catalog from John W. Hobbs Corp. describes the firm's standard-type pointer and direct-reading meters, and flush-mounting-type pointer and direct-reading meters. Charts accompanying each illustration list models, volts, range, restarts after so many hours, and list price. Accessories, general information, and instructions for installing the meters are detailed.

To obtain this bulletin write to John W. Hobbs Corp., 226 Yale Blvd., Springfield, Ill., or use the Request Card at page 18. Circle No. 54.

Testing unit designed for diesel fuel systems

A new-type diesel fuel-system testing unit for General Motors Series 71 engines is available from Diesel Control Corp. Designed for use in servicing injectors and pumps, the unit is suitable for injector calibrating and running-in.

The Unitest Model U-8000 calibrating fixture is electric motor driven, with a clutch throw-out of the camshaft drive. A locking lever positions the injector to be calibrated and run-in, and automatically connects the fuel-in and overflow lines. The fuel is stored in the base, and passes through both a strainer and final stage filter between the General Motors primary pump that is directly connected to the motor, and the injector. Cam, rocker, arms, tappet, roller and other moving parts are standard GM Series 71 parts.

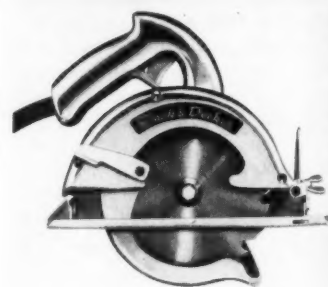
The calibrating mechanism consists of a standard graduate glass, and a timer that permits continuous identical calibrating runs. The use of this unit reportedly eliminates the chance of an injector being put back into service that does not exactly equal the fuel delivery of others being put in the same engine.

For further information write to the Diesel Control Corp., 226 North Marine Ave., Wilmington, Calif., or use the Request Card at page 18. Circle No. 123.

Strong accent on safety in heavy-duty radial saw

A new 6½-inch heavy-duty saw that will cut a 2×4 with blade to spare, thereby permitting several resharpenings, has been introduced by The Black & Decker Mfg. Co. The new tool is reported to give heavy-duty power for the toughest jobs.

The manufacturer stresses the safety features of the new saw. A



newly designed switch guard prevents accidental tripping of the instant release switch. An open end handle makes possible, quick, easy gripping or release. To keep chips and dust from flying in the operator's eyes, there is a built-in chip deflector. As in other Black & Decker saws, there is an automatic telescoping blade guard that opens as each saw cut is started and springs closed when the cut is completed.

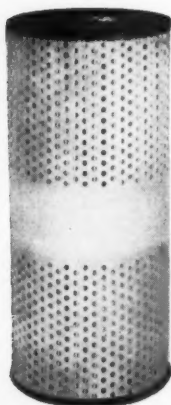
The heavy-duty saw has a maximum depth of cut of 2 5/32 inches at 90 degrees and 1 7/8 inches at 45 degrees. Weight is 11 pounds.

For further information write to The Black & Decker Mfg. Co., Joppla Road, Towson 4, Md., or use the Request Card at page 18. Circle No. 65.



103 drawbar horsepower is feature of new International TD-18A Diesel crawler.

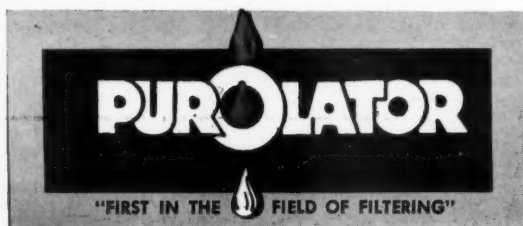
Is every filter refill "good enough" for a heavy duty diesel like this?



The answer is the same for any Diesel — substitutes for manufacturer-approved filter refills are *not* "just as good." And for one simple reason: filters that "will fit" in a full-flow system can't always handle the volume they get on the job. Oil still reaches the engine, of course — the by-pass valve takes care of that. But it's dangerous unfiltered oil that pours into your Diesel. Laden with abrasive, this oil can wear a bearing seriously in a matter of hours.

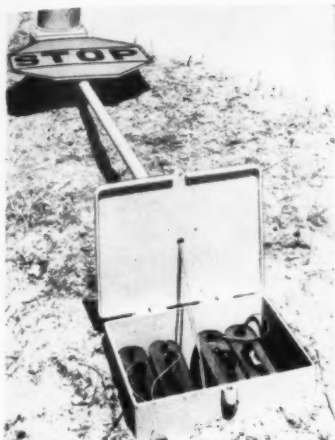
That's why your International Harvester dealer-distributor gives you only manufacturer-approved replacement filters. They are made by Purolator to International Harvester's own exacting engineering standards.

For the same reason, your Diesel deserves only manufacturer-approved oil filter refills too. Its engine life depends on it.



PUROLATOR PRODUCTS, INC., Rahway, New Jersey, and Toronto, Ontario, Canada

For more facts, use Reader-Reply Card opposite page 18 and circle No. 268



The Neo-Flasher Model 5-100 signal light carries two standard storage batteries in its base.

Portable signal light is battery-powered

■ Neo-Flasher Mfg. Co. announces the introduction of a portable or permanent Model 5-100 traffic signal light. This standard 8 $\frac{3}{4}$ -inch-lens model is a "Stop" and "Caution" battery-operated flashing light which meets regulation standards.

The Neo-Flasher 5-100 is constructed with cast-iron battery case. The sign standard screws into the hinged lid of the battery case for easy access. For permanent installation, the battery case is bolted to a concrete foundation with four screws. The hinged lid makes changing of the battery for recharging quick and easy.

Tests indicate the unit will flash for 750 hours (30 days and nights) on two standard storage batteries, without recharging. Visibility rating is well over one mile. The Model 5-100 is recommended for emergency use on superhighways, at highway construction sites, and wherever a portable signal light is needed.

For further information write to the Neo-Flasher Mfg. Co., 3210 Valhalla Drive, Burbank, Calif., or use the Request Card at page 18. Circle No. 40.

Jack-repair service plan facilitates repairs

■ A new hydraulic jack repair service plan has been adopted by Templeton-Kenly & Co. which makes it easier for users of Simplex hydraulic jacks to get fairly priced repairs in the field with genuine factory parts. Under the plan, carefully selected jack repair shops in all important industrial areas are being franchised by Templeton-Kenly as factory-authorized service depots. Each authorized service depot can be identified by a special insignia which will be prominently displayed by the shop.

According to a Templeton-Kenly spokesman, this positive identification of qualified service depots will help contractors get honest dependable repairs by men who have been especially trained to service Simplex hydraulic jacks.

For further information write to Templeton-Kenly & Co., Broadview, Illinois, or use the Request Card at page 18. Circle No. 125.

AN IMPORTANT FEATURE of the Kelley power trowel is a smooth-functioning automatic clutch, made by the Mercury Clutch Division of Automatic Steel Products, Canton, Ohio. With power transmitted through this clutch, the blade pitch and motor speed correspond to the resistance of the concrete being troweled. The clutch's slipping action prevents accidental digging in of the blades and avoids motor strain. For further information write to the Kelley Machine Division, Weisner-Rapp, Inc., 1600 Seneca St., Buffalo 10, N. Y., or use the Request Card at page 18. Circle No. 133.



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WIRE 1105 ROPE

1105 WIRE is the strongest and toughest rope wire that has ever been developed.

Royal Blue is a new all-steel wire rope. It's made of 1105 wire—stands up in service—gives you more for your money because it has more to give.

Ask us for the full facts about Royal Blue Wire Rope, or contact your Roebling distributor.

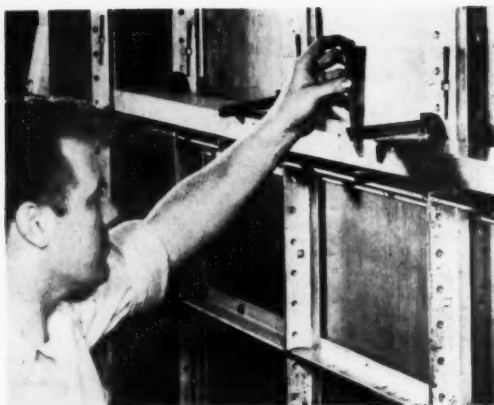
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 269



Universal's Liner-Loc clamp tightens alignment lumber against form panels when a steel wedge is inserted in the two arm loops of the clamp.

High-speed liner clamp cuts form-alignment time

■ A new liner clamp for attaching alignment lumber directly to Uni-Form concrete form panels eliminates wooden wedges, nails, and liner hooks, and permits one man to align forms in a fraction of the usual time, according to the manufacturer, the Universal Form Clamp Co.

Called Liner-Loc, the clamp attaches directly to the steel frame of the Uni-Form panels in one or two seconds. Alignment lumber is merely set in place. To complete alignment, a workman merely swings the upper arm into place and inserts a steel

wedge in the arm loops. Tapping the wedge down tightens aligning lumber against the Uni-Form panels and brings the entire form into line.

Malleable iron casting with the steel wedge makes the Liner-Loc a permanent piece of equipment which can be re-used indefinitely. Elimination of nails makes for longer life of alignment lumber.

For further information write to Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 39.



L-O-N-G Reach, plus LIFT Ability!

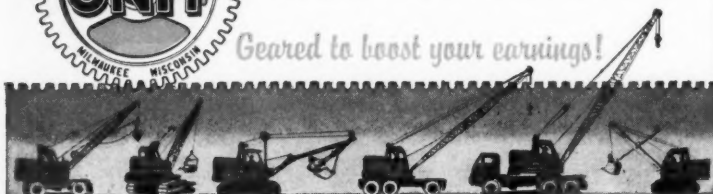
The UNIT Challenger comes in handy for *any* construction job, large or small. On the poured basement job shown above, for example, the Challenger has plenty of reach and lift ability for handling the heavy concrete forms. And it does the work quickly, efficiently and at low cost. Challenger features include: One-piece cast main machinery case . . . Modern transmission design . . . Alloy steels and forgings . . . Involute splines . . . Force feed lubrication . . . Straight-in-line engine mounting . . . Hydraulic actuated clutches . . . Full floating, trunnion-mounted taper drums . . . Torque Converter . . . Safety-promoting, full vision cab . . . Full convertibility to all attachments. Compare the Challenger, part for part, with any machine of its size and type. Then you will realize why it leads the field in design and performance. Bulletin C-800 gives all the facts.

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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 270

Small mobile trailer has variety of uses

■ A low-cost utility trailer, 17 feet long, 7 feet 10 inches wide, and 10 feet high, has been placed on the market by the International Trailer Co., Inc. The new unit may be used as a field office, a storage room, tool or parts room, or machine shop.

Offering over 100 square feet of floor area and over 668 cubic feet of storage space, the new trailer has a strong structural-steel longitudinal frame and a marine plywood floor.

Electrically welded 6-inch I-beam mains and 8 structural-steel cross members compose the chassis. The running gear consists of a single heavy-duty drop-axle with Timken roller bearings and 10 leaf springs. Two trailer-coach tires and two-wheel Warner electric brakes, hub caps, and a towing ball are also featured.

The door opening is double-braced with 2x4's and window openings are reinforced with 2x2's. All overlap joints are mortised. Corners are sealed with a metal corner molding over rubberized tape. All seams are sealed and caulked to waterproof the unit. Heating equipment is optional.

For further information write to the International Trailer Co., Inc., 5712 Erdman Ave., Baltimore 5, Md., or use the Request Card at page 18. Circle No. 126.

New masonry drills have improved design

■ An improved line of carbide-tipped masonry drills has been placed on the market by Super Tool Co., Detroit, Mich. Replacing the conventional spiral flutes on the new Core-Vent drills are wide milled slots for the ejection of chips. Packing and binding are eliminated, and less heat is generated. Two of the carbide teeth undercut clearance so that the core can be removed easily as a solid piece.

Removable shanks, in sizes from 5/8-inch to 6-inch diameters, permit extension drilling of deep holes and access to hard-to-reach spots. The drills are available in 1/4 to 6-inch hole size.

For further information write to the company, or use the Request Card at page 18. Circle No. 137.

CONTRACTORS AND ENGINEERS



The American Brick Hop, available in two models, may be hoisted by a high-lift unit, then moved around on the scaffold.

Brick cart features hydraulic lift system

The American Road Equipment Co. announces production of a wheel-mounted brick cart that can be hoisted by a high-lift unit, then easily moved about on the scaffold. Light in weight, the Brick Hop features sturdy construction and a simplified hydraulic lift system.

The unit is available in two models. The full-pallet model, No. 5591, is designed to carry an average-size pallet with approximate dimensions up to 32 x 32 inches, and has a capacity of 1,500 pounds. The hydraulic lift system with automatic tilt-back has a maximum lift of 16 inches at the tip of the fork and 7 inches at the heel of the fork. The forks are adjustable. This model has a length of 60 inches, width of 48 inches, and height of 39 inches. The front wheels with 4.00 x 12 pneumatic tires have housed roller bearings.

The half-pallet model, No. 5592, is designed for a pallet with approximate dimensions up to 16 x 32 inches, and has a capacity of 1,000 pounds. It is 59 inches in length, 33 inches in width, and 39 inches in height. Other construction features are the same as the full-pallet model.

For further information write to the American Road Equipment Co., 4302 N. 28th St., Omaha, Nebr., or use the Request Card that is bound in at page 18 of this issue. Circle No. 42.

Baldwin-Lima-Hamilton integrates subsidiaries

Four wholly-owned subsidiaries of the Baldwin-Lima-Hamilton Corp., Philadelphia, Pa., have been dissolved as independent firms and been integrated as divisional units in a nation-wide organization.

The companies are: Austin-Western Co., Aurora, Ill.; Hydropress, Inc., New York, N. Y.; Pelton Water Wheel Co., San Francisco, Calif.; and the O. S. Peters Co., Washington, D. C. Austin-Western will now be known as the B-L-H Austin-Western Works. Hydropress will operate as the B-L-H Loewy-Hydropress Division.

B-L-H Pelton Division is the new name of the Pelton Water Wheel Co., and the Peters organization will do business as the Peters Plant of the B-L-H Electronics and Instrumentation Division.

The changes became effective on January 1.



"Of course, I don't want to make this a mud-slinging campaign, but—"

Clipper

ALL NEW 36 H.P. Self-Propelled CONCRETE SAW

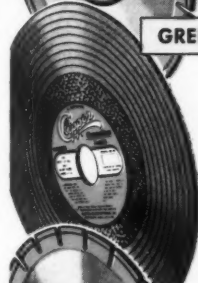
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A "Must" when low-cost Abrasive Green-Con Blades are used. Adjusts for diminishing blade diameters. Allows full depth use of each blade. Protects Diamond Blades from bumping and scraping.

FREE TRIAL DEMONSTRATION

Ask about FREE demonstration on your own job... see for yourself Why 4 out of 5 Buy CLIPPER.

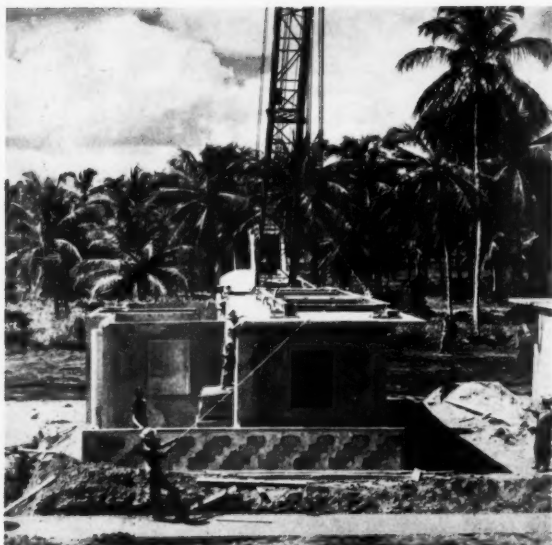
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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 271



Half a roof slab is vacuum-lifted into place since the 22-ton weight of an entire roof would be too much for an ordinary crane. After the two sections are stripped and placed, the longitudinal joint is packed with grout.

Mass production techniques spur Puerto Rican housing job

Precast concrete, vacuum method used for 1,500 homes; native labor does the job with small equipment roster

By G. V. CARLSON, Vacuum Concrete Inc., Philadelphia, Pa.

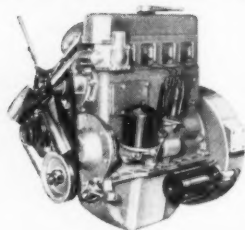
As the first homes in the Los Angeles development in Puerto Rico neared completion, they showed that production-line methods work as well on building jobs as they do in industry. Careful study of production details, apportionment of work to small well trained crews, and the use of modern construction techniques permitted close adherence to a precise schedule of three houses a day. As the work progressed, this rate, although small for the United States, was frequently exceeded without difficulty.

Home Builders Corp. of Santurce, and Vacuum Concrete, Inc., Philadelphia, Pa., are building the development, which will include more than 1,500 homes, a commercial center, schools, churches, and a community recreation area. A sewage-disposal plant which has also been installed will eventually tie in with the expanding San Juan municipal system.

The Los Angeles development is being constructed of precast concrete throughout. Timber does not meet FHA standards for Puerto Rico, and

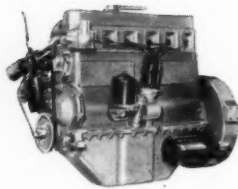
HERCULES announces new INTERCHANGEABLE models

G.O. SERIES GASOLINE OVERHEAD VALVE



G.O. 4 CYL.

G.O. 4 CYL.
Model Max. H.P.
G.O. 173 67 @ 3200 R.P.M.
G.O. 198 76 @ 3200 R.P.M.
G.O. 226 87 @ 3200 R.P.M.

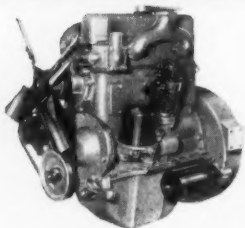


G.O. 6 CYL.

G.O. 6 CYL.
Model Max. H.P.
G.O. 260 102 @ 3200 R.P.M.
G.O. 298 114 @ 3200 R.P.M.
G.O. 339 131 @ 3200 R.P.M.

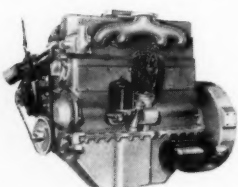
Also available for L. P. G., Kerosene and Natural Gas

D.D. SERIES DIRECT INJECTION DIESEL



D.D. 4 CYL.

D.D. 4 CYL.
Model Max. H.P.
D.D. 173 50 @ 2000 R.P.M.
D.D. 198 57 @ 2000 R.P.M.
D.D. 226 65 @ 2000 R.P.M.



D.D. 6 CYL.

D.D. 6 CYL.
Model Max. H.P.
D.D. 260 75 @ 2000 R.P.M.
D.D. 298 85 @ 2000 R.P.M.
D.D. 339 99 @ 2000 R.P.M.

Additions—to the extensive line of Hercules Engines

With the addition of these four new series consisting of 12 models, the Hercules Motors Corporation has increased its line of engine sizes and types to better serve the varied needs of the many industries which require gasoline and diesel engines for their power requirements. This expansion of the Hercules line will enable manufacturers of end products to have a wider selection of engines and power units to meet individual requirements, all available from one dependable source.

Mounting dimensions of the new G.O. gasoline and D.D. diesel four cylinder engines are the same. The G.O. gasoline and D.D. diesel six cylinder engines are also interchangeable from the standpoint of mounting dimensions. Since this new series consists of parallel lines of gasoline and diesel engines, they can be used interchangeably, if desired, in any end product within the recommended engine speed ranges. Further, these engines can be built with manifolds and accessory equipment on either side, as the cylinder blocks are symmetrical and can be turned end for end.

Another important feature of these new models is the great number of parts which are interchangeable between the fours and sixes, and also, between the gasoline and diesel. This greatly simplifies the parts and service requirements. The only essential differences between these gasoline and diesel engines are cylinder heads, manifolds, pistons and fuel handling equipment.

Further information on the G.O. and D.D. series may be obtained by writing the factory.

**HERCULES MOTORS
CORPORATION
CANTON, OHIO**

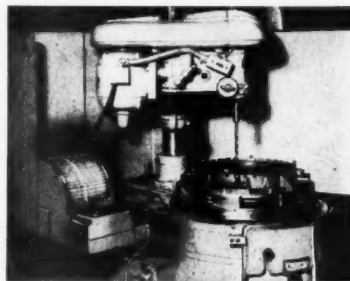
For more facts, use Reader-Reply Card opposite page 18 and circle No. 272

ROCKFORD

MEMO—Clutch must have accurate balance

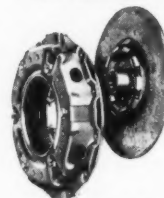


ALL ROCKFORD clutch plates not only are carefully checked for accuracy of dimensions, but are inspected on an electronic balancing machine. Uniform operation, minimum wear,



Let our engineers show you how ROCKFORD quality safeguards insure low maintenance for ROCKFORD clutch equipped machines.

SPRING



LOADED

less frequent adjustment and long life qualities of ROCKFORD CLUTCHES thus are protected during production.

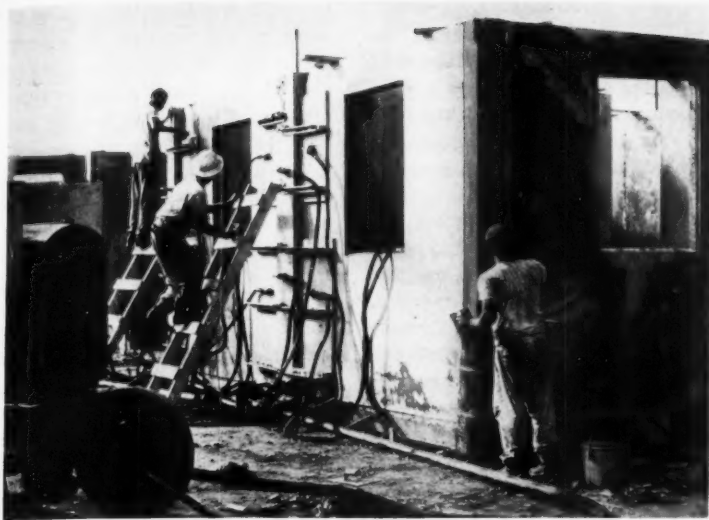
**ROCKFORD
Clutch Division
BORG-WARNER**

314 Catherine St., Rockford, Ill.

CLUTCHES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 273

CONTRACTORS AND ENGINEERS



Forms are stripped about 15 minutes after pouring. Although the concrete is hard, no actual set has taken place, and it can be rubbed or worked with an edging tool.

masonry has too many limitations for the area. Since Home Builders had considerable experience in pre-casting through construction of tilt-up commercial buildings, and was also familiar with the vacuum method developed by Vacuum Concrete, Inc., the two firms consolidated efforts in the design and construction of the building.

In spite of Puerto Rico's rapidly expanding industrial potential, it is still not economical to use the more expensive time and labor-saving ma-

chines available in the U. S. because of the reasonable labor market. Construction machinery on the job was therefore held to a minimum, with only two cranes, two pavers, a small batching plant, two fork trucks, three dump trucks, and the special vacuum equipment being used.

Construction procedures

Continuous footings 6 inches wide were dug to a minimum depth of 2 feet around the periphery of the

(Continued on next page)



Vacuum-held closure forms hold the joints between the precast wall panels as concrete is poured. Atmospheric pressure holds the forms securely against the wall and extracts excess water from the joint.

MORE THAN **80%** OF ALL PAVED ROADS ARE NOW SURFACED with **ASPHALT**

CUMMER
BATCH-TYPE
ASPHALT
PLANTS...

...CONSISTENTLY PRODUCE RECORD
TONNAGES WITH LESS DOWN-TIME

You can't beat the actual experience of "old hands" who have been operating Cummer Asphalt Plants for years when it comes to telling the real story behind Cummer equipment.

Such an "old hand" is Mr. Henry W. Jenkins, Vice-President of the Savannah Asphalt Company of Georgia. Mr. Jenkins says, "Our Cummer Portable Asphalt Plant—shown in the picture above—is rated at 60 to 70 tons per hour capacity. It's been delivering that in the three years we've owned it, and we're still surprised at how little we've had to shut down for repairs and replacements. The way we figure it, ruggedness and efficiency are built right into these Cummer Plants."

Cummer Asphalt Plants are batch-type complete with all motors and starter switches and all moving parts are individually motor driven.

Write now for your copy of the fully-illustrated Cummer catalog giving complete specifications on all plants and accessories.



THE F. D. CUMMER & SON CO.
1827 EAST 18th ST. • CLEVELAND 14, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 274

FEBRUARY, 1956

Light as a Feather



For a BRADEN Winch

Heavy loads that are awkward to handle are light as a feather for a BRADEN Winch. Time-consuming jobs like putting a roof girder in place, for instance, can be done in a minute or two.

BRADEN's smooth controls, and sure patented automatic safety brake is especially important in precision handling jobs. Be safe . . . be sure . . . have a BRADEN Winch installed on your trucks for all types of handling jobs.

See Your Braden Dealer or
Write for Complete Information

BRADEN WINCH COMPANY
P. O. Box 547, Broken Arrow, Oklahoma



"IN SERVICE AROUND THE WORLD"

For more facts, use Reader-Reply Card opposite page 18 and circle No. 275

(Continued from preceding page)

building and a shallow footing was also provided under the center bearing position. After plumbing, electrical conduits, and reinforcing had been placed, the 4-inch floor slab was poured monolithically with the footings. In addition to the main reinforcing steel, dowels were placed in the floor and left protruding vertically at the points where they would intersect with the poured-in-place wall joints.

Soil conditions were such that the only forms required for this operation were those at the exterior face of the footings. In fabricating these forms, provisions were made to form a 1x5-inch depression around the outer edge of the slab to facilitate

erection of the 4-inch-thick precast wall panels.

Floors, serving as a casting deck for the horizontally precast wall panels, were given a smooth trowel finish and sprayed with a commercial separating compound. The bond breaking compound also served as a membrane-curing compound, something necessary in the Puerto Rican climate.

The day after the floor slabs were poured, 4-inch steel channels, secured at the corners by wedge-bolts, were set up on the floors to serve as edge forms for the wall panels. The reinforcing mat, prefabricated and delivered from a central point on the project, was then placed in the form. Where necessary, plumbing and electrical facilities were also placed be-

fore pours were made.

Road-paving machines offered the most efficient and economical means of placing concrete during the continuous pouring operations. The pavers were charged by two dump trucks serviced by a small batching plant erected at the job site.

Immediately after pouring and screeding, vacuum-processing mats were applied and, after ten minutes, the concrete was machine-troweled. Vacuum processing proved advantageous not only for the immediate finishing of the panels, but also because it made it possible to remove edge forms after one hour and to prepare panels for another pour. With this system, the wall panels for a complete house were cast on a single floor slab, one on top of the other,

in stacks five high. By reducing the water-cement ratio of the concrete, the vacuum processing also induced high early strength, which permitted erection of the panels the day after they were poured.

The use of vacuum lifters permitted panels to be stripped from the stacks and erected without inserting strongbacks, or additional reinforcing to withstand point stresses. Although this method has been used for many years in the U. S., Europe, and South America, it was an innovation in Puerto Rico. It is similar to conventional tilt-up construction, but differs in that the panels are lifted horizontally clear of the casting bed, turned in the air to a true vertical position, and lowered into place. This eliminates the chipping and spalling of the bottom "hinge edge" of the panel usually associated with ordinary tilt-up construction.

Rough preformed wooden braces held the panels plumb temporarily, and as soon as two adjacent pieces were trued up, their protruding reinforcing bars—plus the vertical footing dowels—were spot-welded. Vacuum closure forms were then set up, and the joints, actually flush columns, were poured in place. The vacuum forms make use of atmospheric pressure to hold the forms securely against the wall sections and to extract the excess water from the concrete in the joint. Fifteen minutes after pouring ended, the vacuum valve was closed, and the forms were released, completely removed, and set up immediately at the next joint.

Several factors prompted the contractor to use this type of connection. First, although the climate of Puerto Rico is mild, there are frequent heavy, and sometimes driving, tropical rains. Since the vacuum action reduces the water-cement ratio of the concrete to about 0.35, a shrinkage-free, water-resistant union was assured. This, combined with a very simple key formed by small angle irons welded to edge forms, made a closure joint which can withstand these rains.

Secondly, carpentry operations could be accomplished simply and economically with prefabricated forms and no bracing. When vacuum holders were placed against the wall and a valve opened, the forms were held tightly against the panels without shoring or nailing. Since they automatically paralleled the panels they joined, no additional aligning was required. The pressure of the forms against the precast walls also prevented leakage of grout and the formation of the fins frequently associated with cold joints. Releasing the forms was as simple as setting them, and as many as ten uses of each form daily was not uncommon.

Roofs were poured and vacuum processed, one on top of the other, on movable casting platforms adjacent to the houses. Since the 22-ton weight of an entire roof would have made handling difficult with a crane of ordinary capacity, roofs were poured in halves. After the two sections were stripped and placed with the vacuum lifter, the longitudinal joint was

Operator Report:



Close-up of Twin Disc Fluid Power Take-Off which protects both driving and driven equipment on UC55 Link-Belt Speeder (below) owned by Jack & Jim Maser, Inc. of Brownstown, Pa.



Operator, Daniel Peffley says:

"... Fluid coupling increases production — is easier on machines and operators ..."

"Until a fellow operates a machine equipped with a fluid coupling, the ads concerning its advantages seem like a lot of sales gab. However, from experience gained in eight years of shovel operations—I can honestly say there is a decided advantage in the Twin Disc Fluid Power Take-Off. It increases production, and is easier on the operator and machinery."

The preceding is from an unsolicited testimonial by Daniel Peffley, operator of a UC55 Link-Belt Speeder, for Jack & Jim Maser, Inc. of Brownstown, Pa. Since he started operating this machine, Mr. Peffley

has worked on a variety of jobs—digging ditches for water lines, lowering pipe, unloading hydrants, pulling pipe under road crossings, and backfilling. In each instance, he says, "the fluid power take-off increased production, extended cable life and made my job much easier."

The Twin Disc Fluid Power Take-Off provides a "cushion" that eliminates shock loads—protecting both driving and driven equipment. It prolongs the life of cables and substantially reduces fuel consumption and maintenance costs.

Daniel Peffley's story can be your

story. Specify Twin Disc Fluid Power Take-Off when next you buy a shovel. Twin Disc Clutch Company, Racine, Wisconsin, Hydraulic Division, Rockford, Illinois.



closed. This was done by welding the protruding reinforcing, including vertical dowels, from the center wall, then packing the joint with grout. The main center bearing wall acted as the bottom form for the grouting operation. This joint also served for the principal electrical conduits, which were placed prior to welding and grouting operations.

The roof slabs were secured to the walls by eight weld-plate inserts placed in a small blocked-out section of each poured-in-place joint. After welding, these pockets were filled with grout.

A slight slope was precast into the roof panels—4½ inches at center to 4 inches at eaves—to provide ample run-off during heavy rains. The dense treated concrete proved sufficiently watertight and, in accordance with FHA regulations, no built-up roofing was applied. No insulation was required by FHA standards because of the mild climate.

In the early stages of construction, a detailed field study determined the exact number of men required in each crew to insure that all groups produced in a timed sequence. Minor personnel changes at the beginning eliminated over-running of essential functions with the consequent "waiting for work" idle time. For example, the pouring of floors and footings was kept two days ahead of the erection crew. It was found in practice that the vacuum-processed wall panels could be handled by the vacuum lifter the day after pouring, but the two-day time lag was continued in order to permit flexibility in operations in the event unforeseen delays, such as late delivery of materials, held up any single operation. This spacing also assured ample working room for each crew.

The final plumbing, electrical, and millwork installations, as well as painting, was programmed in the same manner.

Personnel

Juan J. Otero, president of Home Builders Corp., was in over-all charge of the project. Angel Aviles was the architect, and Ulpiano Barnes and Ventura Barnes were responsible for procurement and field coordination. The vacuum operations were directed by Mandel Leder of Vacuum Concrete, Inc.

THE END

Geophysical surveys

Literature from Gahagan Construction Corp. describes that company's method of geophysical surveys. These surveys give a picture of overburden strata and bedrock and the depths at which these will be found. An explanation of seismic refraction, the four methods used by Gahagan, the accuracy of the surveys, applications and costs of such surveys, and other topics are discussed. Two articles on seismology are included.

To obtain this literature write to Gahagan Construction Corp., 90 Broad St., New York 4, N. Y., or use the Request Card at page 18. Circle No. 48.

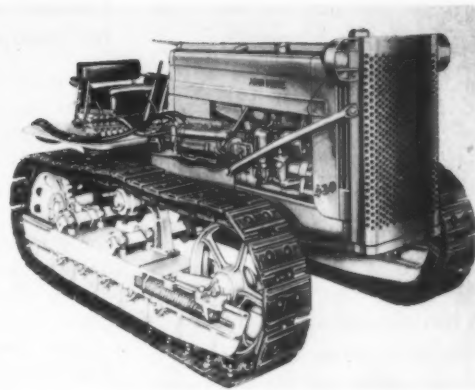
Redesigned light tractor has increased horsepower

The new John Deere Series 420 tractor, either crawler or wheel-mounted, is now in production. These new machines closely resemble the Series 40 tractors, which they replace; but the new two-cylinder, valve-in-head engine delivers approximately 20 per cent more power.

It is estimated that the increase will bring the tractors close to 30 belt horsepower. Drawbar horsepower is increased from 20 to around 25.

The additional power is attained primarily by changes in the bore, the cylinder head, valve mechanism, manifolding, carburetion and the new compression ratio of 7 to 1. A new pressurized cooling system with water

The John Deere Series 420 crawler tractor has an increased horsepower rating estimated at 30.



pump and thermostat replaces the thermo-siphon system formerly used. Pistons are 4¼-inch-diameter aluminum.

For further information write to Deere & Co., 330 River Drive, Moline, Ill., or use the Request Card at page 18. Circle No. 84.



HOPTO

DIGGER • SHOVEL • CRANE

Does the work of 16 MEN!



MODEL 200 DTM
BACKHOE OR
SHOVEL BUCKET

digs DEEP ... lifts HIGH ... easy to operate!

Here's the fast-cycling HOPTO unit that equips you to profitably handle more jobs at lower equipment investment! The completely hydraulic HOPTO mounts on any 1½ ton or larger truck... one that may have been "written off" but can still serve as a mobile base for this work-hungry, big-capacity unit!

Four simple and easily mastered control levers give finger-tip operation that is fatigue-free. That means more work done *more safely!* Retractable hydraulically operated outriggers quickly level unit... provide a solid, *safe* base from which to operate.

OTHER MODELS

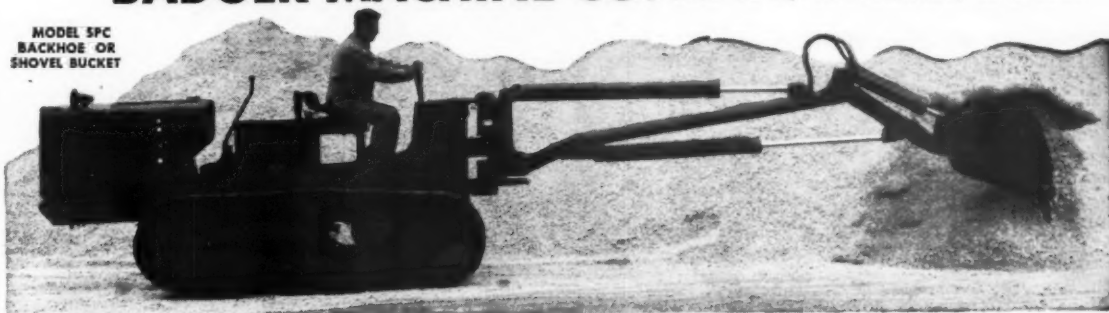
From the large track-type continuous Badger Trencher down to the trailer-type HOPTO, Badger manufactures a complete quality line of digging equipment. HOPTO is also available as a power take-off operated or self-powered trailer model, as a unit for rear mounting on track-type or wheel-type tractors, as a complete self-powered wheel unit, the crawler unit shown below, the truck mounted unit illustrated above and a slightly smaller unit for truck mounting. HOPTO builds a *quality* unit to meet *your* needs, exceed *your* expectations.

CHECK THESE HOPTO FEATURES

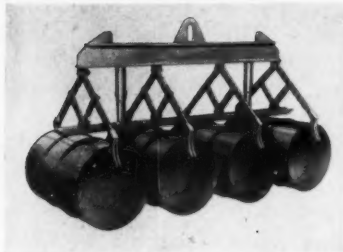
- Dipper stick extension tilts digging unit 135°; permits straight side, vertical digging. Eliminates hand work.
- Digs 11½' below surface.
- Lifts 13½' high with shovel bucket; more than 9' with backhoe.
- Alloyed steel hardened pins and self-aligning bearings at all pivot points.
- Variety of widths and types of backhoes and shovel buckets.
- Backhoes and shovel buckets have H & L teeth.

WRITE FOR FREE FOLDER!

BADGER MACHINE CO. DEPT. E, WINONA, MINN.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 277



Lifter allows one operator to handle up to six drums

■ Handling and storing of drums is fast and simple with the new Downs horizontal drum lifter, an automatic grab that allows one hoist operator to handle from three to six drums in a single lift.

In picking up a load, the grab is spotted over a row of drums, then lowered until the hooks engage the ends of the drums. When drums have been set down, the grab continues to lower until the center bar forces the hooks open. The grab can then be slid off the end of the row and lifted clear of the drums.

For further information, write to Downs Crane & Hoist Co., 540 W. Vernon Ave., Los Angeles 37, Calif., or use the Request Card at page 18. Circle No. 95.

Offer new pipe hook with safety handle

■ The Newco pipe hook, the newest addition to the Newman Mfg. & Sales Co. line of wire rope fittings and supplies, boasts a safety handle said to



eliminate the danger of injury to workmen's hands.

The pipe hook can be used by a crane or manually when putting a pipe in position for welding or connecting. A cluster of two to four hooks can be used on a spreader for loading or unloading pipe.

The manganese-steel hook is for use with Newco $\frac{3}{8}$ or $\frac{1}{2}$ -inch combination clamp and thimble or regular shackle.

For further information write to Newman Mfg. & Sales Co., P. O. Box 5939, Kansas City 11, Mo., or use the Request Card at page 18. Circle No. 91.

Production welding tooling

■ Pandjiris Weldment Co. has issued a 28-page catalog on production weld tooling. Included in the catalog are application photographs of equipment used especially in the construction industry.

To obtain this catalog write to Pandjiris Weldment Co., 5152 Northrup Ave., St. Louis, Mo., or use the Request Card at page 18. Circle No. 25.

Colored drafting pencils for blueprint drawing

■ A German-made colored drafting pencil that is said to blueprint perfectly and to simplify complicated technical drafting has been introduced in this country by J. S. Staedtler, Inc. Called Mars-Lumochrom, it reportedly offers all the fine drafting characteristics of high-quality black graphite drawing pencils.

Color drawings made with Mars-Lumochrom pencils are waterproof,

erase perfectly, and do not smear or fade, according to the manufacturer. The leads hold a fine point without frequent sharpening, producing long, even lines. Since all 24 colors have the same degree of transparency under carbon-arc and mercury-vapor lamps, good blueprints are said to be the result. Each pencil will draw two miles of lines.

For further information write to J. S. Staedtler, Inc., 25 Dicarolis Court, Hackensack, N. J., or use the Request Card at page 18. Circle No. 101.

Three-way snowplow

■ The Wausau Triple Threat, a three-way snowplow for airports, turnpikes, thruways, and all modern highways is fully described in a catalog from Wausau Iron Works. The manufacturer claims that this is the first major snowplow improvement in years.

To obtain this catalog write to Wausau Iron Works, Wausau, Wis., or use the Request Card that is found in at page 18 of this issue. Circle No. 20.

How to CUT CLEARING COSTS

To help you clear land faster and cheaper, here are NEW IDEAS developed by clearing specialist Wade Lahar Construction Co. These "tricks" will help Lahar and their 22 International tractors finish a 23,500-acre job at Buford Dam 7 months ahead of an 18-month schedule.



1-to-5 slopes, 1,300 acres per month—Your TD-24 will efficiently clear trees from steep grades as well as from level ground. Here's what Herman Hackler, project manager for Lahar on the \$1,611,560 contract, says about this big 200 hp, 8 mph crawler: "TD-24's high-low steering range keeps cutter against the tree until it falls, even on steepest slopes. This factor, plus the '24's' great power, excellent traction, and over-all balance, is letting us crawler-cut 99% of our Buford Dam job, despite slopes averaging 1-to-5, and, in some places, 1-to-4. Our fleet of 22 International tractors—11 TD-24's (four of them with cutters), six TD-18's, three TD-14's, and two TD-9's—clears and rakes 1,300 acres per month. This production, in our opinion, could not be exceeded by any other make of tractor!"



One pass levels 18-inch trees—Where clearing ground level is your primary job, Contractor Lahar recommends a big International tractor and V-cutter. The cutter shown was designed and built by Herman Hackler, project manager, at Lahar's plant in Mountain Home, Arkansas. Four International TD-24's, so equipped, are handling most of the Buford Dam reservoir clearing at Atlanta, Georgia. In typical operation, they cut so much land that 18 other International tractors

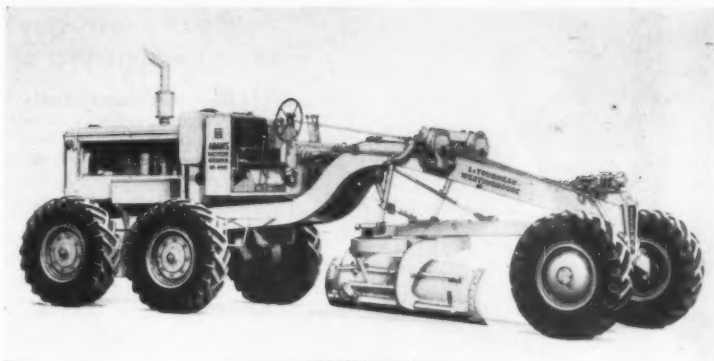


Burn, turn with one tractor—On big jobs, Lahar suggests use of one medium-sized tractor to handle burning of brush piles. This leaves bigger chins free for production work. Note how cleared ground is behind tractor. When Lahar's job is done, some 14,000 acres will be completely cleared about 9,400 acres partly cleared, with some trees standing in the water to benefit future waterfowl.



Team decking boosts output—Where terrain permits three to six of Lahar's 22 IH crawlers team to pile the cut brush and trees. This gives two advantages . . . (1) rakes, by catching both ends of trees and brush, pick up material lying between tractors which normally would require separate passes. (2) one pass per team is all that's needed to produce a clean swath.

THE ADAMS 660 motor grader, formerly driven by a Cummins 140-hp diesel engine, is now powered by either a Cummins or GM 150-hp engine. Changes in horsepower ratings were made in the entire Adams line, as well as in the 660. Previously powered by a 115-hp engine, the Adams No. 550 is now equipped with a 123-hp GM or Cummins unit. The No. 440 is now offered with a 100-hp Cummins or a 104-hp GM engine rather than the 100-hp International engine that had formerly powered it. The No. 330 may now be had with an International 75-hp diesel or a Cummins or GM 80-hp engine. For further information write to Le-Tourneau-Westinghouse Co., 2103 N. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 114.



U. S., England offer aid for Aswan Dam in Egypt

Construction of Aswan Dam on the Nile River in Egypt—a project under discussion for a number of years—got a step nearer reality with the assurance of the U. S. and England that an initial grant of \$70 million would be forthcoming to help get the work started. Altogether, \$1,300,000,000 will be needed to finance the dam, which will be able to flood an area three times larger than Lake Mead, the 246.5-square-mile body of water behind Hoover Dam on the Colorado River.

Of the initial \$70 million grant offered, which Egypt has yet to accept, \$56 million would come from the U. S. and \$14 million from England. The first installment would be used in building three cofferdams and foundations for the dam, together with some of the seven tunnels which have to be hewed through granite.

The proposed dam, it is estimated, would irrigate some two million acres of land, 1,300,000 acres of this for the first time. A power station with a capacity of 750,000 kilowatts at the dam would amount to about half the present output of Egypt. Construction of the dam would take about fifteen years.

Foundation concreting

A catalog from Intrusion-Prepackt, Inc., describes the Prepackt method of concreting for cofferdam seals, bearing and cut-off piles, foundation and soil stabilization, and structural concrete repairs. Data is given on Prepackt services, methods and materials, and advantages. Action shots and diagrams are included.

To obtain this catalog write to Intrusion-Prepackt, Inc., Union Commerce Bldg., Cleveland 14, Ohio, or use the Request Card at page 18. Circle No. 52.

Armco to erect building to handle new product

Construction has started on the \$1½ million building being erected by Armco Steel Corp., Middletown, Ohio, for the production of its new line of prefabricated, truss-type, steel buildings. The new plant will use the same design features as the prefabricated buildings manufactured there.

The building, to be located on a 20-acre site, will cover 150,000 square feet. Truss members of cold-formed steel will be used.

For more facts, circle No. 278



Blade "saws" larger trees—If your clearing work involves trees larger than 18 inches, here's another idea from Wade Lahar Construction Co. Using same mild-steel cutter blade as on smaller trees, have TD-24 operator "see-saw" back and forth a few times to cut the trunk. Just a few seconds' work with the 64,000-lb TD-24 will topple the tree.



busy decking and burning. One pass of their 13-ft, 14-ft wide blade slices saw-like through brush, pine, mixed hardwoods up to 18 inches in diameter. For larger trees up to 12 inches in diameter, a similar but smaller cutter is used on a 66 dhp International TD-14A. Both TD-24 and TD-14 have a canopy of 2 1/2-inch pipe. This protects operator and machine. Fire canopy and cutter assembly pins to regular frame... can be quickly detached and interchanged for standard or other special blades.



Winches logs from swamp—Clearing from marshy areas may present you with quite a problem too. Wade Lahar Construction Co does this work, 1% of their 23,500-acre Corps of Engineer job, with chain saw crews and winch-equipped TD-9 and TD-18 crawlers. After winching in, tractors skid timber to central area.

Efficient in-the-field maintenance boosts output, too. Left, mechanic uses compressed air to blow dirt and leaves from TD-24 radiator core. Right, special steel tooth, 2½ ft long with 18-inch overhang, is welded to TD-24 blade. Four teeth and top blade extension are used per raking tractor.

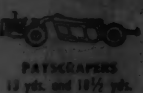
International

makes every load a pay load

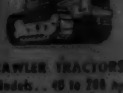


Industrial Power

INTERNATIONAL HARVESTER CO., 140 N. WICHITA AVE., CHICAGO 9, ILL.



PATCHERS
13 yds. and 18½ yds.



CRAWLER TRACTORS
8 Models... 40 to 200 hp



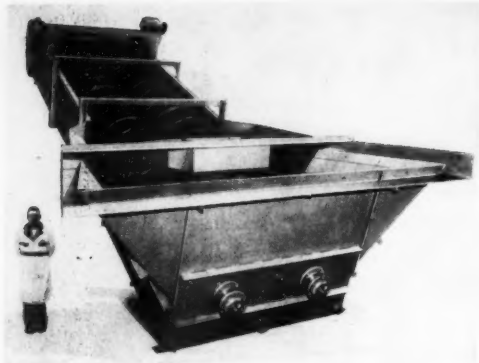
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18 Models... 16½ to 200 hp



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The new large Eagle washer-classifiers have replaceable Ni-Hard shoes on the screw unit.

Improvements in line of washer-classifiers

■ Eagle's new large fine-material units for washing and classifying concrete aggregate are equipped with welded steel ribbon-type screws which

have replaceable Ni-Hard shoes on the wearing edges.

The Ni-Hard nickel alloy iron used in these shoes is highly abrasion-

resistant. When shoes do become worn they can be replaced without need for replacing the entire screw unit.

The new flared design of the tub provides a greater settling pool at the feed-in end of the washer-classifier. Lower bearings are Hydrotex marine-type and are water lubricated under pressure.

For further information write to Eagle Iron Works, 159 Holcomb Ave., Des Moines, Iowa, or use the Request Card at page 18. Circle No. 88.

David White names officer

The new president and general manager of the David White Co. of Milwaukee, Wis., is William Balch. White manufactures precision optical and engineering instruments.



Small, light chain hoist handles 250 pounds

■ An 11-pound Midget chain hoist capable of lifting 250 pounds has been developed by the Coffing Hoist Division of Duff-Norton Co. to fill the need for a small, fast, safe hoist. The new unit has a standard lift of 7 feet and a minimum distance of 9 inches between hooks. Extra chain is available for greater lifts.

Coffing reports that one man can easily lift a load 30 feet in one minute with the midget hoist, which can be used for lifting building materials, in maintenance shops, and for other jobs. The load is held safely by an automatic load brake at all times, greatly reducing the possibility of accidents from falling loads.

Ball-bearing trolleys rated at 250 pounds and made to fit all standard 3 to 10-inch I-beams also are available from Coffing. The trolleys have carburized, hardened wheels and grease seals for complete protection against dust and grit. Diameter of the tread of the wheel is 2 1/4 inches and the weight of the trolley is only 12 pounds.

For further information write to Coffing Hoist Division of Duff-Norton Co., 800 Water St., Danville, Ill., or use the Request Card at page 18. Circle No. 93.

Striping machines

■ Wald Industries, Inc. now offers a 32-page catalog on the Reflecto-Liner, a striping machine for streets, highways, airports, and industry; the Airomixer, for any type paint; and the Automatic Sign Shop, a continuous operation that sprays undercoatings and reflective coatings uniformly, then sets them firmly by infra-red heat. Each model is illustrated, and there is a description of features and specifications. Accessories also are listed.

To obtain Catalog W-56 write to Wald Industries, Inc., Huntingdon, Pa., or use the Request Card that is bound in at page 18 of this issue. Circle No. 60.

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HENDRIX Dragline Buckets ... very much in the picture

A TYPE FOR EVERY DIGGING PURPOSE 1/4 to 40 Cubic Yards

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 279



Avoid legal pitfalls

Temporary injunction against project denied

THE PROBLEM: A New York town board awarded a contract to repair and improve an airport runway. The work was half completed before a taxpayer sought to enjoin further work, on the following grounds: (1.) The contractor had been permitted to use marl from a town pit when the contract required him to furnish the marl; (2.) Although the contract required construction of a drainage crown on the runway, the contractor had been permitted to maintain the existing grade, without any readjustment of the contract price; and (3.) The specifications were drawn up by a town supervisor who was not a professional engineer, an alleged violation of a New York statute. Was the taxpayer entitled to have the work suspended by temporary injunction pending a final decision in the case?

THE ANSWER: No. (Shaw v. Topping, 142 N. Y. Supp. 2d 490, decided by the New York Supreme Court, Suffolk County, Special Term. This decision, being by a trial court, is subject to review and possible reversal by a higher court.)

The court reasoned that it would be unfair to the town and the contractor to halt the work because it was uncertain whether the contract would be ultimately declared to be invalid.

It would take a trial to determine whether it was necessary that the specifications be prepared by a professional engineer, especially in the absence of proof that the work done and to be done would not conform to professional engineering standards.

However, the court said that the contractor would proceed under risk that it might be finally decided that the contract was invalid. The town was ordered to withhold payments until a final decision was made.

Damage to equipment leased from owner

THE PROBLEM: While being used to unload heavy equipment from a railroad flatcar, a crane was damaged when a sling attached to it gave way and the load fell on it. The sling was furnished with the crane, which had been leased from the owner. Was the lessee liable for the damage?

THE ANSWER: No. (Leake v. Nelson Co. v. W. J. Megin, Inc., 111 Atl. 2d 559, decided by the Connecticut Supreme Court of Errors.)

The court said that the accident was due to the lessor's negligence in supplying a defective sling.

The court noted that the case was governed by the general rule of law governing the leasing of chattels to the effect that return of the property in damaged condition gives rise to a presumption that the injury was caused by the lessee. But when he offers evidence tending to show in-

For more facts, circle No. 280→

Edited by A. L. H. STREET

Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

jury from a cause for which he was not to blame, it is up to the lessor to prove by the greater weight of evidence that the lessee's negligence caused the damage.

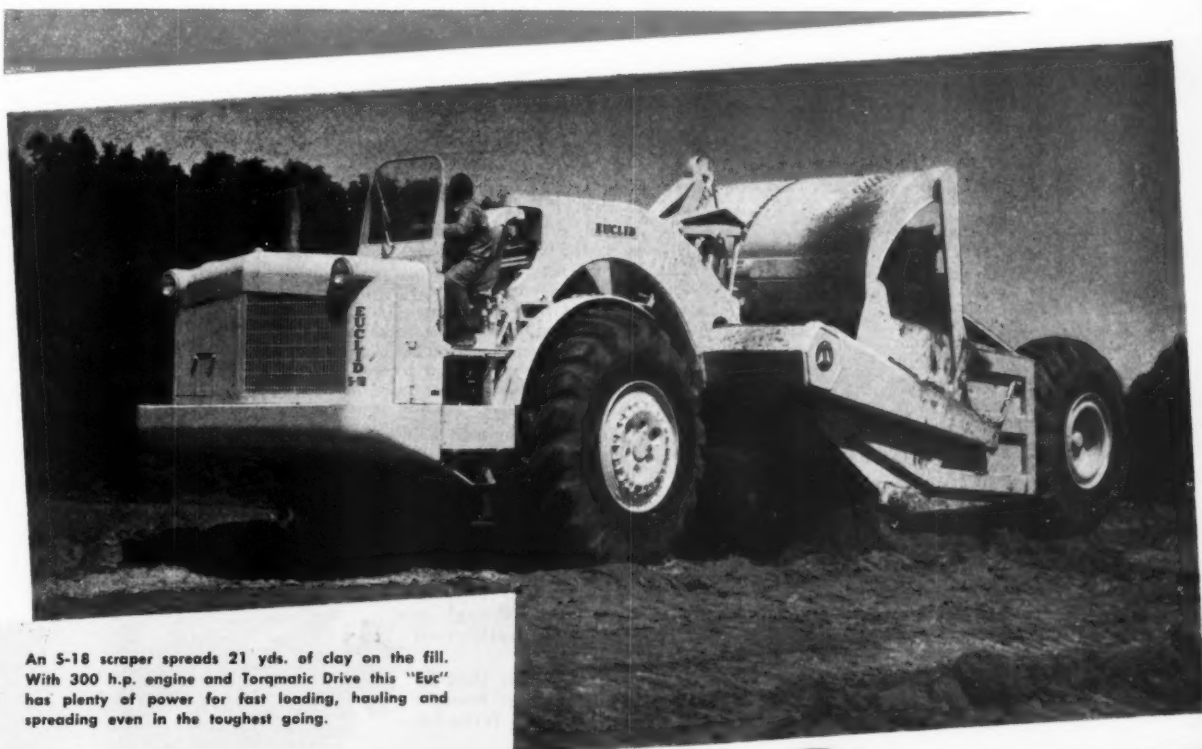
Contractor's liability for employment taxes

THE PROBLEM: Federal prime contractors gave the required statutory bond for payment for labor. A bank having suspended advances to a subcontractor, the prime contractors advanced money to the subcontractor, as earned, to enable the latter to pay his employees, payroll taxes, and material bills. The subcontractor filed returns covering withholding and other payroll taxes with the Internal Revenue Bureau but did not pay them. Could the government hold the prime contractors liable on a theory

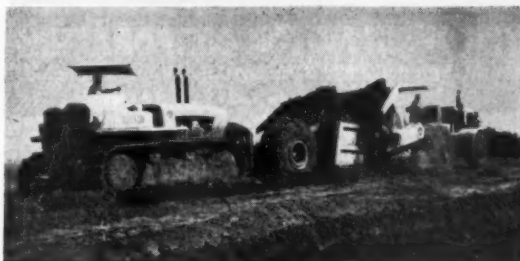
that they were the employers of the subcontractor's workers, within the meaning of the statutes imposing federal insurance contributions, and withholding and unemployment taxes?

THE ANSWER: No. (Westover, Collector of Internal Revenue v. William Simpson Construction Co., 208 Fed. 2d 908, decided by the United States Court of Appeals, Ninth Circuit, approving a decision to the same effect by the United States District Court, Southern District of California, 100 Fed. Supp. 125.)

The Court of Appeals said that it "would be an arbitrary perversion of the legislative purpose" of the Miller



An 5-18 scraper spreads 21 yds. of clay on the fill. With 300 h.p. engine and Torqmatic Drive this "Euc" has plenty of power for fast loading, hauling and spreading even in the toughest going.



A total of 688 h.p. at work here! Two 194 h.p. engines in the Euclid TC-12 Crawler and 300 h.p. in the "Euc" Scraper made short work of getting heaped loads of sand in a hurry.



Dumping their big loads on the fly, Bottom-Dump "Eucs" made fast cycle time from borrow pit to fill and back again. They were loaded by 2½ yd. draglines and a Euclid Loader.

49 "EUCS" on Heavy Road Grading Job

Contractors who know their earth moving equipment use "Eucs" on the tough, rush jobs. They know from experience that they can rely on Euclids to get more work done at the lowest cost per yard... and keep doing it month after month.

This 6.3 mile road project in Illinois is a typical example. S. J. Groves & Sons Co., J. C. O'Connor & Sons Co. and Potashnick Construction Inc. put 49 "Eucs" to work on a total of 2,238,171 cu. yds. of earth excavation. Grading operations started the middle of July and were completed the end of September. These contractors used 24 Euclid Scrapers, 23 Bottom-Dumps, a "Euc" Loader and a new TC-12 Twin-Power Crawler... 47 out of 68 hauling units on the project were "Eucs"!

Hauls from borrow pit to fill ran as high as 4500' and averaged about 3000'. Daily production was around 50,000 yds. Fills of 22' to 36' were necessary to raise the road above high water level of the Wabash and Little Wabash Rivers during flood periods. Operating personnel on this job—with the biggest fleet of earth moving equipment ever used on an Illinois road project—say that "Euc" performance played the major part in completing the earth moving in such fast time.

It's performance like this that makes "Eucs" important to the profit picture on hundreds of construction jobs... a good reason why EUCLIDS are your best investment.

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FOR MOVING EARTH, ROCK, COAL AND ORE



Act (40 U. S. Code, section 270a and following sections) to interpret the requirement for a bond to protect laborers and materialmen, as being usable as "a weapon in the collection of taxes."

Legality of award to second-lowest bidder

THE PROBLEM: All nine bids on a city reservoir were below the engineer's estimated cost of \$313,200. The lowest bid, \$242,469, promised completion in 270 days. The contract was awarded on the next lowest bid, \$246,746, with the job to be completed within 200 days. Bidding specifications did not fix a completion date. Was the award beyond the

power of the city authorities, especially since the successful bidder's equipment and crew were ready to proceed and the foreman was experienced in the exact type of work involved?

THE ANSWER: No. (Nicklaus v. Miller, 66 N. W. 2d 824, decided by the Nebraska Supreme Court.)

The court said that for lack of proof to the contrary, it must be presumed that the officials acted honestly and in good faith to serve the public interest.

As to the time-for-completion date, the court said that it was not necessary that bidding specifications fix a date, although the time element was important. That decision was influenced, however, by the fact that

the instructions to bidders specified that time was a "basic consideration" and would be taken into consideration in making an award.

Contractor has duty of shoring excavation

THE PROBLEM: An owner of premises undertook construction of a building and acted as his own general contractor. Excavation was let under a contract that did not require shoring. But, under state administrative rules adopted under the New York Labor Law, the excavating contractor was bound to shore for the safety of employees of others working on the construction job. After the excavation had been completed, an em-

ployee of the owner-contractor was injured by a soil slide due to lack of shoring. (1) Was the excavating contractor liable to the injured man? (2) If so, was he entitled to reimbursement by the contractor-owner, on a theory that the latter was primarily at fault?

THE ANSWER: (1) Yes. (2) No. (Rufo v. Orlando, 141 N. Y. Supp. 2d 24, decided by the New York Supreme Court, Appellate Division, First Department.)

Although two judges dissented, a majority of the court decided that because of the excavator's legal duty to shore, he could not shift liability to the owner-contractor, even though he was under no contractual obligation to shore.

Subcontractor had right to impound city funds

THE PROBLEM: A contractor on a municipal sewer assigned to a subcontractor the right to collect from the city proceeds payable under the contract. If the only funds out of which the city could pay the contract debts were on deposit in a bank and were being disbursed without providing for payment of the subcontractor, could the subcontractor, in a suit against the city and the bank, secure a court order impounding the funds?

THE ANSWER: Yes. (Robinson v. City of Pine Bluff, 276 S. W. 2d 419, decided by the Arkansas Supreme Court.)

The court broadly declared that whenever anyone is in possession of a fund against which there are conflicting claims and it is shown to the satisfaction of a court that the interests of a claimant may be endangered if the possession is continued, the court may assume control over the fund until there is a decision as to ownership.

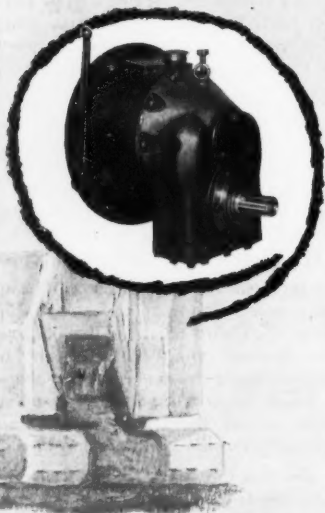
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50 YEARS OF BETTER GEAR

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You can't do better than to specify "Wisconsin Power" for your equipment. Write for Bulletin S-187.



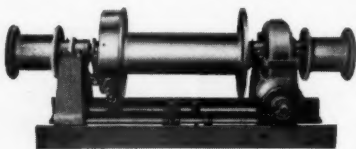
WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
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CONTRACTORS AND ENGINEERS

Dust raised by truck was not a nuisance

THE PROBLEM: Kansas counties are liable only for road accidents named by statute, but may be liable for damages resulting from maintaining a "nuisance." Could a county be held liable for injury to a truck passenger for injuries sustained in collision with a county truck that was hauling gravel and created dust that obscured vision on the highway? The plaintiff's theory was that operation of the truck without warning signs constituted a nuisance and was not mere negligence, for which the county would not be liable.

THE ANSWER: No. (Keesee v. Board of County Commissioners, Kiowa County, 281 Pac. 2d 1089, decided by the Kansas Supreme Court.)

The decision is chiefly of interest to road contractors in its intimation that they might be liable on a theory of negligence if steps were not taken to guard against collisions in dust clouds stirred up by gravel trucks.

"Unused" distributor unit may be warranted as new

THE PROBLEM: The seller of a 1,500-gallon distributor for use on road-building equipment warranted that the unit was "new." Was the warranty broken because the distributor had been manufactured four years before it was sold, even though it had been properly stored in the meantime?

THE ANSWER: No. (Ajax Petroleum Products Co. v. Blake, 126 N. E. 2d 926, decided by the Ohio Court of Appeals, Franklin County, Columbus.)

The court said that it was immaterial that the distributor had been exhibited at two road shows; that, although in some instances "new" may imply recent manufacture it also implies unimpairment by use;

and that common understanding in a given trade may be controlling. It is commonly understood, the court said, that a "new" automobile is one that has not been used.

Materialman's claim preceded federal tax lien

THE PROBLEM: A South Dakota building contract provided that no payment should be made to the contractor until the delivery of a release of all liens arising out of the contract. A federal statute gave the United States a lien against a delinquent taxpayer's "property and rights to property" for unpaid income, withholding, and social security taxes owed by the contractor. Did the claims of a ma-

terialman against funds retained by the owner take precedence over the federal government's lien?

THE ANSWER: Yes. (Scott v. Zion Evangelical Lutheran Church, Chamberlain, S. Dak., 70 N. W. 2d 326 decided by the South Dakota Supreme Court.)

The court said that the contractor had no right to so much of the retained funds as was necessary to pay material claims and that the federal government could have no better right than he had.

Unemployment money denied for lack of cause

THE PROBLEM: A stone mason had worked intermittently for the same

employer for two years. On the last job he was to be paid at the end of each week, and was so paid for two weeks. On Monday of the fourth week he quit because the employer requested him to wait four days for final payment covering the third week. Under Pennsylvania law, was he entitled to unemployment compensation covering the four days?

THE ANSWER: No. (Vancheri v. Unemployment Compensation Board of Review, 112 Atl. 2d 433, decided by the Pennsylvania Superior Court.)

The law allows compensation to an employee voluntarily quitting for "good cause", but this provision requires an employee to use ordinary common sense and act with good faith.



With all 4 primary contractors using Jersey Spreaders to lay both the rock base and fine cushion on West Virginia's new 88 mile Turnpike, as much as 22,000 tons were laid in a single day! . . . easily attached to any tractor, Jersey Spreaders have proven the fast, economical way to spread material.

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Shorter over-all length for BIGGER LEGAL PAYLOADS.

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NEW MODEL 700 above, hauls up to 8-plus yard loads, guaranteed to mix any 7-yard batch. 75" drum head, 16° slope for shorter over-all length, more favorable center of gravity, larger legal payloads. CONSTRUCTION MACHINERY CO., Waterloo, Iowa.

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Construction Machinery Co., Waterloo, Iowa

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The DIESELPACK cleans more oil faster — keeps it CLEAN longer — and gives more service and better engineered protection than ANY of the substitute filtering elements being offered for Luber-finer units.

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Blasted rock and mica schist is loaded into an end-dump by one of the Bucyrus-Erie 88-B shovels on the job. Rock not being used as fill on the section is being dumped in a waste area that will not be visible to motorists.

C&E Staff Photos

Tough excavation for pike concentrated in one stretch

Large equipment spread handled excavation of rock and earth for new Massachusetts road

The most rugged section along the 123-mile right-of-way of the east-west Massachusetts Turnpike is the 13½-mile stretch between Otis and Russell, a stretch involving the excavation of more than 2,000,000 cubic yards of rock and 2,600,000 cubic yards of earth. This, the largest amount of excavation along the route, is being handled by S. J. Groves & Sons Co., Minneapolis, Minn., under two separate contracts totaling \$8,320,426.

Just a month after the first contract was awarded last March, the firm started moving rock with a huge fleet of equipment manned by 350 men working two 10-hour shifts. An additional 200 men were put on the job when operations reached their peak.

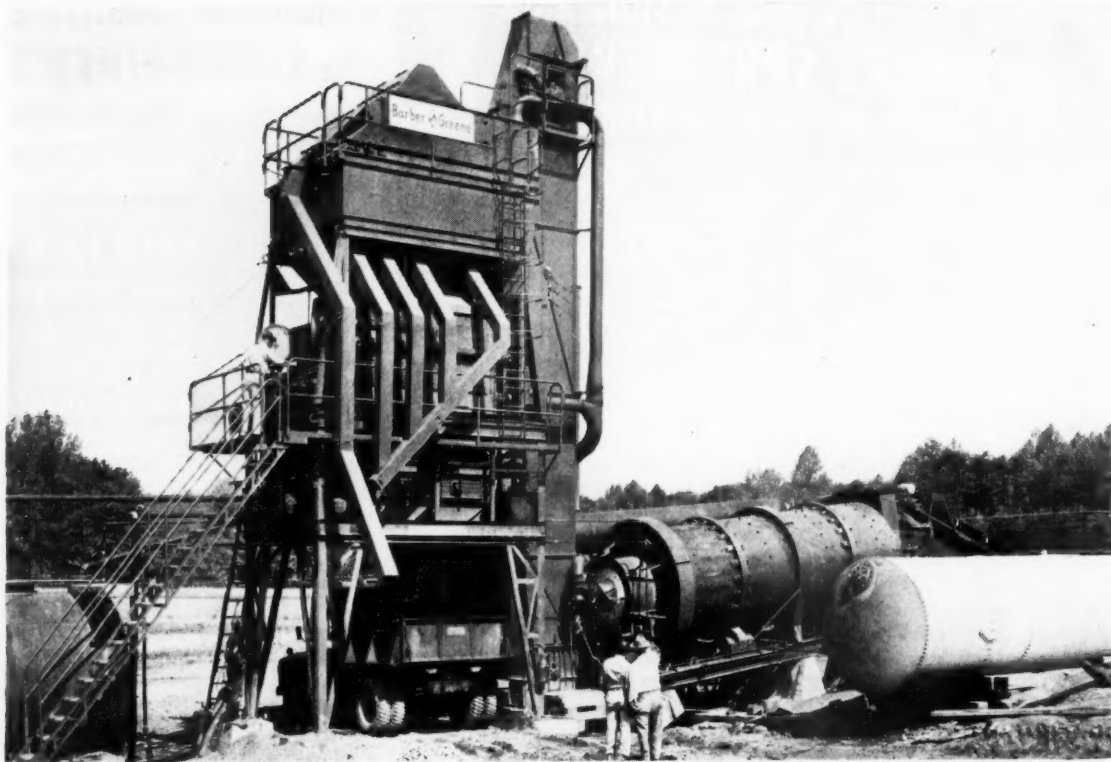
Since rock cuts go more than 125 feet deep, the contractor brought two Bucyrus-Erie 88-B shovels to the job, each having a 4½-cubic-yard bucket. Powered by Buda diesels, these rigs are each removing about 2,800 cubic yards of rock—mainly mica schist—every 10 hours.

Aside from these two big shovels, the contractor is using a variety of equipment to keep work moving along on this big job. Among the machines are three B-E 54-B's, three Northwest 80-D's, two B-E 22-B's, and a Bucyrus-Erie 38-B. Earthmoving operations are being done by four Caterpillar DW21 tractors, seven Caterpillar and LeTourneau scrapers, and thirty to forty end and belly-dump Euclids. Rock removal is being facilitated by the use of 12 Gardner-Denver air-track drills, 25 Gardner-Denver and Ingersoll-Rand wagon drills, and 12 Ingersoll-Rand 600 Gyro-Flo air compressors.

All this equipment does not include the fleet of Caterpillar D6, D7, and D8 tractors that are being used to pull roller compactors and assist shovels in the rock cuts. Allis-Chalmers HD-21 tractors are scattered along this spread, push-loading the scrapers to capacity. Scores of roller compactors and graders are also on the job.

Heavy going in rock

Drilling operations on the deep rock cuts are being spurred along by Gardner-Denver air tracks with carbide inserts. Supplied with air by a bank of air compressors, the air tracks are drilling a 2½ to 3-inch hole about 27 feet deep, then moving forward by means of the air-oper-



One of the many Barber-Greene BatchOmatic Asphalt Plants setting new low cost production records in the United States and Canada.

Now . . . two, four and six thousand pound Barber-Greene BatchOmatic plants

Less than a year ago Barber-Greene introduced the revolutionary BatchOmatic—the first plant ever designed from its original conception for completely automatic operation. In that short time the success of this batch plant has been established all over the United States and Canada. Owners and operators everywhere report that the automatic operation has reduced their costs, increased production and expanded their market. Inspectors find that the BatchOmatic consistently produces mixes to specification with automatic accuracy.

Now the Barber-Greene BatchOmatic is available in three sizes: two, four and six thousand pounds.

Now you can choose the capacity that best meets your needs and get the money-making design features that lead the field . . .

Simultaneous weighing of all sizes of aggregate . . . to eliminate the human element in achieving accuracy and maximum capacity.

Instant change-over from automatic to manual operation . . . to provide mixes for the drive-in trade . . . instantly reset to preset repetitive cycle operation.

New Dyna-Mix pugmill . . . to give more thorough coating in less time than any other pugmill.

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CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT
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ated tracks to another position. Rows of drill holes are 8 feet apart, with the holes in each row spaced from 8 to 10 feet. This drilling pattern is occasionally changed to meet varying rock conditions, so that maximum fragmentation can be obtained. Wagon drills were used in the same way as the air tracks, but steel bits were used in mica schist. Carbide inserts were used whenever quartz was hit.

Some of the rock blasted with approximately one pound of dynamite per cubic yard is loaded on Euclid end-dumps by the shovels and hauled to designated waste areas that will not be visible to motorists using the pike. A large portion, being used as a part of the 4,000,000 cubic yards of fill required, is hauled from deep cuts to fill areas by Euclids. Earth excavation used as fill is loaded in Euclid belly-dumps by smaller shovels like the Bucyrus-Erie 54-B and the Northwest 80-D, both of which use 2½-cubic-yard buckets. Adjacent cut and fill areas are being handled by Caterpillar scrapers, which are push-loaded to capacity by Allis-Chalmers HD-21 tractors.

The largest fill contains approximately 500,000 cubic yards and covers two 126-inch-diameter multi-plate culverts, each of which is 520 feet long. The single-gage plates for the huge culverts were supplied by Republic Steel Corp. and assembled on the job. A 2-ton-capacity Quick-Way truck-crane, mounted on a GMC war-surplus truck, handled the plates during erection.

Variations in the width of the median strip make the right-of-way vary throughout the 13½-mile section. The 4-foot grassed median running through the area of the deep rock cuts fans out to a 100-foot median strip in level stretches. Side slopes also vary: a side slope of 1 on 4 is provided through the rock cuts; 2 on 1 in earth fills greater than 10 feet; and 4 on 1 where the earth fills are less than 10 feet.

Work started on roadways

The 2-foot-thick base course of select material that Caterpillar scrapers and Euclid belly-dumps are putting down is being compacted by Hyster grid-type and sheepsfoot rollers pulled by Cat D6 and D8 tractors, respectively. On top of this, a 12-inch-thick blanket course of 4-inch-minus gravel is being laid in two 6-inch lifts and compacted to a 95 per cent density by the Hyster grid-type and pneumatic rollers.

By spring, paving operations will be started by the Alexander Construction Co., Inc., Minneapolis, Minn., under a sub-contract with Groves. Paving operations will start with a 5-inch penetration macadam base in two 2½-inch lifts. For this, about 160,000 tons of macadam will be required; the penetration rate will be 1½ gallons per square yard. Then the 3-inch-thick asphaltic-concrete wearing surface will be

placed in two 1½-inch lifts to a width of 12 feet by a Barber-Greene finisher. The first lift will consist of ¾-inch-minus aggregate, while the top lift will contain ½-inch-minus stone. Compaction will be handled by Galion 8 to 12-ton tandem wheel rollers. Alexander plans to use a Madsen or a Barber-Greene 2-ton batch plant to supply the 100,000 tons of material needed for the wearing surface.

When completed in August, this section of the turnpike will have an eastbound roadway consisting of two

(Continued on next page)



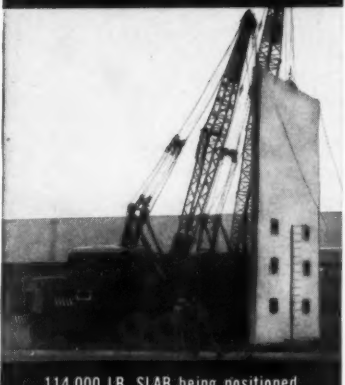
Pulled by a Caterpillar DW21 tractor, a Cat No. 21 scraper delivers earth fill for the turnpike subbase. A Cat D8, left, pulls a sheepsfoot roller to compact the material.



PRECAST PANEL 32' high, 18½' wide with two large window areas.



TRUSS has 60' span at top



114,000 LB. SLAB being positioned



PANEL with door and two window areas

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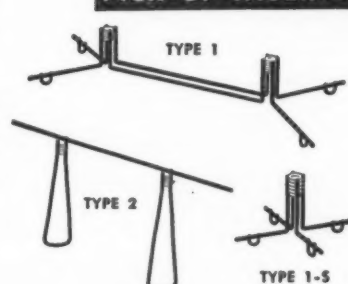
On every Tilt-Up job the proper type of Pick-Up Inserts and Brace Anchors as well as their location in the slab or precast structural member are of prime importance in order to withstand the stresses occurring when *tilting, lifting, and positioning*. As pioneers in this field, SUPERIOR has developed various types of accessories and correct procedures resulting from the experience of thousands of job applications.

SUPERIOR accessories are designed for fast and efficient handling of all types of precast panels and structural members. The Pick-Up Insert provides dependable anchorage for bolts which secure a lifting angle to which slings are attached when the panel is raised. Brace Anchors secure the temporary bolts by which the Braces are attached. The exclusive pivoting action of the adjustable Braces permits quick positioning and alignment of panels. Braces are assembled with 2 x 4's or pipe of lengths to fit job conditions.

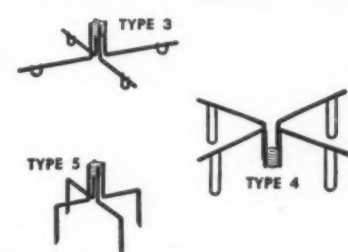
The many types of SUPERIOR Inserts, Anchors, and Braces for every job condition together with complete layout service provide a combination which offers safe and efficient handling of precast panels and structural members.

For further details refer to Sweet's Catalog or send for Bulletin TU-3.

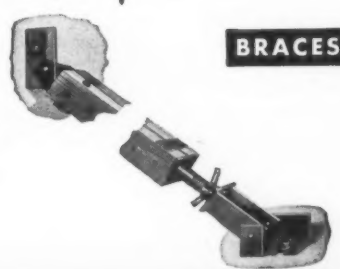
PICK-UP INSERTS



ANCHORS for BRACES



BRACES



SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

New York Office

1775 Broadway, New York 19, N. Y.

Pacific Coast Plant

2100 Williams St., San Leandro, Calif.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 288



(Continued from preceding page)

12-foot lanes with a 10-foot paved shoulder. The westbound side will have 6.9 miles of three 12-foot lanes without a shoulder. The additional lane will be put down in the rocky section having an uphill grade of 3½ per cent for the entire 6.9 miles, so that trucks will be provided with a crawler lane. This stretch, like the rest of the turnpike, has been designed so that it can be converted to a six-lane highway whenever traffic

A row of Gardner-Denver air track drills sink 27-foot-deep holes in a big rock cut. Rows are spaced 8 feet apart, and holes in each row are 8 to 10 feet apart.

C&E Staff Photo

volume is sufficient to justify construction of additional lanes. The \$239,000,000 turnpike, scheduled to be finished by November, 1956, will run west from Route 128 near Weston, terminating near West Stockbridge on the New York State line. A proposed extension will link the road with the New York Thruway.

Maintaining huge fleets

The size of the job to be done, and the amount of equipment needed for it, meant that Groves had to keep all rigs in excellent operating condition constantly. All maintenance is being done in two Butler buildings—one measuring 80 x 100 feet, the other 40 x 60 feet—located almost at the dead center of the project. Here, anything from a small Willys pick-up to the

largest shovel on the job can be completely overhauled. If an engine in any of the Euclid or Caterpillar equipment develops mechanical difficulties, it is ripped out and replaced by one of the eight spare engines on hand in the shop. Then the faulty engine is torn apart and repaired in about two days.

At the end of every 10-hour shift, each piece of equipment is greased and oiled by a mobile greasing unit consisting of a Grayco Convoy Luber mounted on a Ford truck. This supplies equipment with D-A lubricants from six Alemite pumps—two for oil, one for transmission oil, one for converter oil, and two for grease. Two Ford trucks with 3,000-gallon tanks work out of the shop, delivering diesel fuel to equipment.

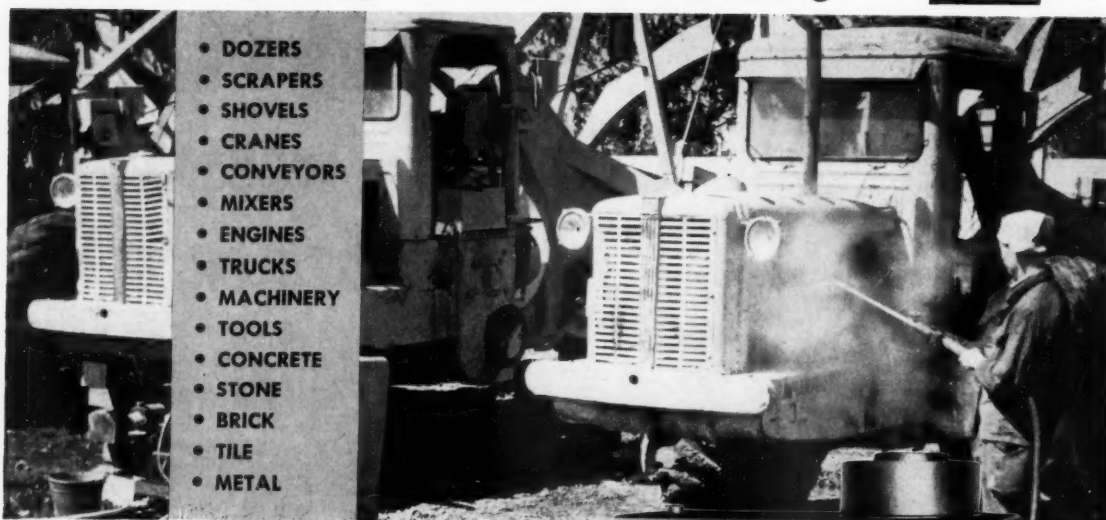
Five Lincoln welding units, three gasoline-operated and two electrically operated, handle all welding work. Power for the shop is purchased locally.

Personnel

The project manager for S. J. Groves, Sam Day, works from an office in an abandoned school building near Blanford. Here, he and his staff have more than ample room. Day keeps in touch with his superintendents and foremen via a General Electric 75-watt base station and 15 mobile-radio units operating on a frequency of 30.58 kilocycles.

E. D. Sargent is general superintendent; Peter Sprenger is project engineer; O. E. Miller, office manager; and Bob Darden, master mechanic for Groves. Bill McQueen is the resident engineer for the consultants, Thomas Worcester Corp., Boston, Mass., on this section of the turnpike. Howard, Needles, Tammen & Bergendoff is the general engineering consultant to the Massachusetts Turnpike Authority. THE END

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One of your men—ordinary labor—can clean more in an hour with Hypressure JENNY, and do it better, than 10 men can clean in the same time, using out-moded hand methods. That means a saving of \$9.00 labor expense on every \$10.00 you now spend, if you clean by hand.

Cleaning-time and labor expense are not the only savings JENNY will make for you. By cleaning equipment *before* repair or servicing, JENNY steam cleaning shortens "lay-up" time as much as 40%; removes mud, muck and grease that slow your mechanics, and increase costs; and gets your equipment back on the job, and earning, in jig time.

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HOMESTEAD
VALVE MANUFACTURING COMPANY
"Serving Since 1892"
P.O. BOX 30, CORAOPOLIS, PA.

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 289

Versatile line of powered hand tools

A new 63-page catalog describing and illustrating the complete line of Mall portable gasoline engine tools is available on request. It contains information on the versatile line of "MG" chain saws, generators, land clearance saws, pumps, earth and wood augers, vibratory earth borers, concrete vibrators, troweling machines, concrete surfacers and attachments, saw chains, conversion sprockets, and accessories. Data on electric and pneumatic chain saws is included.

To obtain Catalog 32 write to Mall Tool Co., 7725 S. Chicago Ave., Chicago 19, Ill., or use the Request Card at page 18. Circle No. 116.

Heavy-duty tractor

An eight-page color catalog from Schramm, Inc., West Chester, Pa., gives details on the firm's Heavy Pneumatractor. There are pictures of the tractor's standard and optional equipment. Complete specifications and design features are included.

To obtain Catalog 5540 write to the company, or use the Request Card at page 18. Circle No. 50.

CONTRACTORS AND ENGINEERS

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RS

The new Davis backhoe digs at right angles to the tractor, and features an operator's seat that revolves with the backhoe boom.

New backhoe features right-angle digging

■ A new backhoe that digs at right angles to either side of the tractor as well as to the rear is announced by Mid-Western Industries, Inc. The new unit is designed to mount directly on the frame of the Davis loader.

In addition to the right-angle digging feature, the attachment has an operator's seat which revolves with the backhoe boom and dipper stick so that the operator is always facing the direction in which he is digging. The seat is equipped with foot rests and has valve controls within easy reach. The operator has unobstructed vision to the bottom of the hole he is digging, even at the maximum depth of 13 feet.

According to the manufacturer, the new Davis backhoe is ideal for cleaning and digging of roadside ditches and irrigation or drainage canals, or for digging around the corner of a building and in crowded areas where trees, boulders, or buildings will not permit a standard backhoe to operate. The right-angle digging feature also allows spoil to be dumped far to one side of the hole, leaving plenty of room in between the spoil pile and the hole so that the dirt will not fall back in.

Individually controlled hydraulic stabilizer feet on each side of the wide frame allow the unit to be leveled up on slopes for digging plumb holes.

For further information write to Mid-Western Industries, Inc., 1009 S. West St., Wichita, Kans., or use the Request Card at page 18. Circle No. 34.

Belt-conveyor idlers

■ Information on the selection, application, and mounting of Marco M14 conveyor idlers is contained in a 16-page catalog from E. F. Marsh Engineering Co. According to the company, this catalog contains specifications for practically every idler in the bulk-handling field—troughing, standard-return, side-guide, self-aligning troughing and return, impact, flat, and heavy-duty idlers.

To obtain Bulletin ID-2 write to E. F. Marsh Engineering Co., 4030 Chouteau Ave., St. Louis, Mo., or use the Request Card at page 18. Circle No. 19.

Lowbowl scraper

■ A folder describing the No. 463 lowbowl scraper is available from the Caterpillar Tractor Co., Peoria, Ill. Complete specifications of this model—including over-all dimensions; bowl, cable, and tire information; and weight distribution—are given. Pictures emphasize the outstanding features of the scraper.

To obtain Form No. 31700 write to the company, or use the Request Card at page 18. Circle No. 4.



MONOTUBE STEEL PILES

... easily extended
right on the job

All it takes is a fast, simple weld to extend Monotube steel piles to any required length. Either standard sections, or for added economy, cut-offs from previously driven piles can be used. And while one pile is being extended, driving continues on an adjacent pile. There's no lost time!

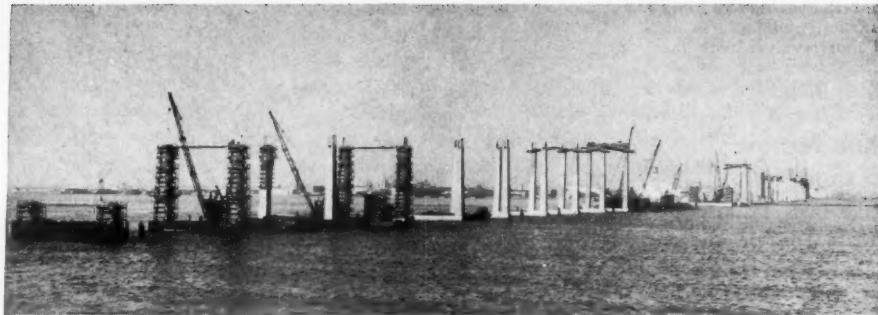
Here's another important point to remember... Monotubes combine light weight and ease of handling with cold-rolled strength for faster driving... and at lower cost! On most jobs, driving can be handled quickly, easily by light, mobile rigs. Find out for yourself how Monotube piles save time and money on all types of foundation work. Write today to The Union Metal Manufacturing Company, Canton 5, Ohio, for your copy of Catalog No. 81.

1906 Fiftieth Anniversary 1956

UNION METAL

For more facts, use Reader-Reply Card opposite page 18 and circle No. 290

This view, looking from Bayonne toward Newark, shows pier shaft and strut forms in different stages of erection. In the foreground, derrick boats place concrete in pier shafts, which are poured simultaneously.



Precise form, concrete work raises piers for turnpike span

by W. ROY SWITZER, field superintendent,
Contracting Division, Dravo Corp.

**Shaft forms facilitate handling, placing, alignment;
200,000 cubic yards of muck is dredged from shallow bay**

**Low-cost SONOTUBES form
supporting columns in less time
and reduce construction cost!**

Technical Bldg., Henry Ford Community College, Dearborn, Mich. Atkin-Fardon Co., contractors; John Anderson Associates, architects.

SONOTUBE[®]

FIBRE FORMS
for round columns of concrete

SONOTUBE-formed round concrete columns were specified for this Henry Ford Community College building to reduce construction time and cost.

These low-cost fibre forms erect easily because they require minimum bracing... handle easily because they are lightweight... and reduce finishing time to a minimum because they strip easily when recommended methods are followed.

SONOTUBE Fibre Forms save time, money and labor! They are specified by architects and engineers and widely used by contractors everywhere!

Available in sizes from 2" to 36" I.D. up to 50' long. Can be sawed to your requirements on the job or ordered in specified lengths. Use Sonoco's patented "A-coated" SONOTUBES for finished columns. Wax coated also available.

For full information and prices, write



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HARTSVILLE, S. C. — MAIN PLANT

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 291

One of the important links in the eight-mile short cut from the Newark Airport Interchange of the New Jersey Turnpike to the Holland Tunnel is the mile-long crossing of Newark Bay, which currently has superstructure work in progress. This span, part of an additional route between New York and New Jersey, is carried by 20 twin-shaft piers varying in height up to 122 feet above normal water level.

Work on the piers, done by Dravo Corp., Pittsburgh, Pa., might have been dangerous and slow but for a number of work methods used and a good step-by-step scheduling of dredging, forming, and concrete placing operations. Four of the piers support the main bridge span; the other 16 serve as the foundation for the approaches. All, built inside single-skin cofferdams with seal concrete placed by the tremie method, are supported by H-beam piling ranging from 67 to 128 feet long and driven into rock.

Work on the substructure was complicated from the start. Newark Bay is shallow, except for the ship chan-

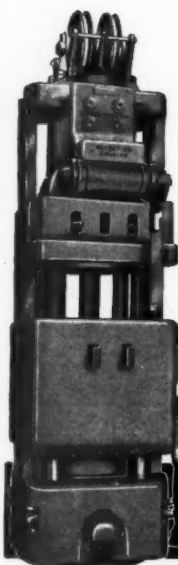
nel, so it was first necessary to dredge a 250-foot-wide working channel about 14 feet below normal tide along the center line of the bridge. This working channel required about 200,000 cubic yards of material to be removed so that floating equipment could get to the sites of the projected piers. Morris & Cummings Dredging Co., Inc., New York, N. Y., did this work with a suction-type dredge under a subcontract with Dravo.

The next move was to drive two 5-pile dolphins at each of the 16 approach pier sites and three 7-pile dolphins at the four main piers. These served as mooring facilities for floating equipment, and helped to locate the pier sites for such operations as pre-excavating for cofferdams and setting cofferdam frames. With the dolphins in place, pier site excavation could be done on any shift without the constant supervision of engineering forces.

Cofferdam excavation

Before cofferdams were installed

Super VULCAN Differential Acting Pile Hammers Drive Toughest Piles



Positive action... simple design
... rugged strength. Specialized
power for driving the heaviest,
longest and most difficult piling.

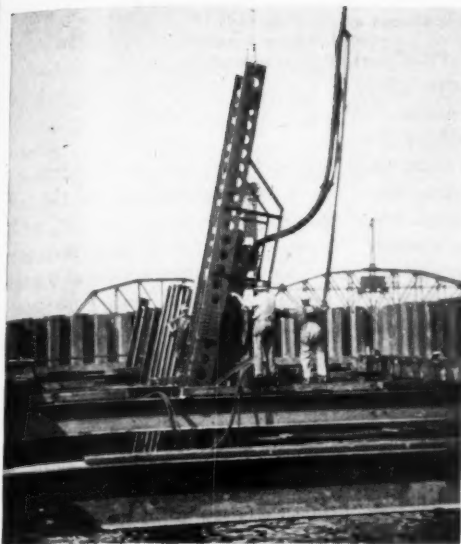
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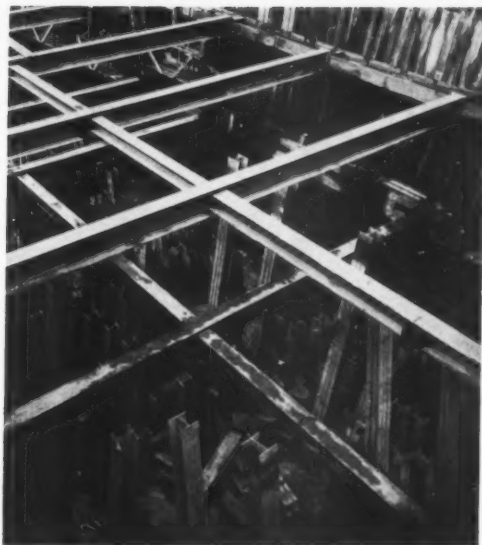


For more facts, use Reader-Reply Card opposite page 18 and circle No. 292

CONTRACTORS AND ENGINEERS



Piling is driven under water for one of the larger bridge piers by a McKiernan-Terry 11-B-3 hammer using a 14-inch H-beam as a driving head. About 3 blows per inch were required to get the piling down the last 50 feet.



Tops of H-beams have been burned off to design height in this cofferdam, following the pouring of the tremie seal. In this pier, 532 piles were driven to rock, the outer groups being battered.

excavation for all 16 approach piers was carried down to about 1 foot below grade to allow for expected swell from pile driving and to provide room for a sand blanket.

Excavation for the smaller two of the four main piers was done to within 5 feet of grade before cofferdams were set. The remaining material was dug out by clamshell buckets after cofferdams were set.

In preparing for the two larger main piers adjacent to the ship channel, the contractor used a suction dredge to bring excavation to within 12 feet of grade, approximately 40 feet below water. At the same time, a spoil area was dredged alongside for the disposal of the remaining 12 feet of material to be excavated. Since the material at the site of the main piers was very adhesive, a trench was dug 5 feet deep on the center line of the sheet pile that would go around the perimeter of the cofferdam. This did away with the need for cleaning the inside of the sheet pile that would be in contact with the tremie concrete.

and facilitated excavation after the cofferdam was in place.

All the cofferdams, of the single-skin-type with arch web and Z-piling, had to be located accurately because battered bearing piling had to be driven close to the sheeting. Cofferdams for the 16 approach piers and the two small main piers were built with a single set of wales and buntions, located above water.

Eight to ten temporary pipe piles—the number depending on the length of the cofferdam—were spaced in pairs and driven inside the cofferdam. A channel section, bolted transversely to each pair of pipe piling at the proper elevation, supported the coffer bracing set. The set, after being fabricated, was placed on its supports and held to the channel section with U-bolts. Then, with the bracing set serving as a template, sheet piling was placed and driven to grade. The coffer set was then bolted to the sheeting and the temporary pipe pile supports removed.

(Continued on next page)

Small Investment buys BIG LOADER performance!

For CLEATED or SMOOTH SHOE . . . LONG or SHORT TRACK CRAWLERS



HARDWORKING HEAVY-DUTY DOZER-LOADER

Fits
TD-6, D-2, or Oliver A
ONLY \$1925.00
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Also made for Oliver B

FULLY HYDRAULIC
Ideal for replacing
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PUT-ON . . .
TAKEN OFF
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without modifying tractor!

For full information WRITE TODAY!

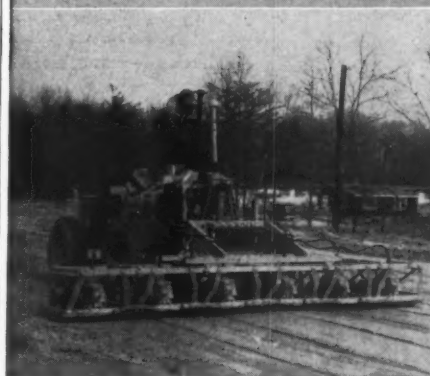
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UNUSUALLY DEPENDABLE LOADER
Tough, durable . . . built to take ANYthing a crawler can give it . . . with smooth or CLEATED shoes. The finest in hydraulics, including high quality cylinders with chrome plated shafts of "Stress-Proof" steel . . . heavy-duty pump . . . removable, zer-lubricated, alloy-steel bushings at ALL hinge points . . . assure fast, positive action. With hydro valve in "Raise" position, loaded bucket rises to full height in about 8 seconds while operator maneuvers tractor. The quality construction, plus the proven performance of the TEALE is your guarantee of dependable, trouble-free operation.

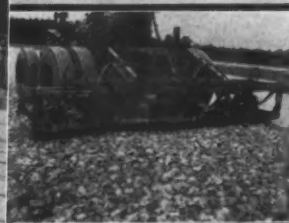
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FEBRUARY, 1956

BASE COURSE DENSIFICATION at its QUICKEST and BEST



6 COMPACTING UNITS IN WORKHEAD for maximum productivity in straight-away work. Left: Compacting sand fill in a bridge approach . . . another phase of its wide range utility to paving contractors.



4 COMPACTING UNITS just fit this widening job—change required in only a few minutes.



3 COMPACTING UNITS in tandem and staggered, suits this job ideally—a quick and easy change.



1 COMPACTING UNIT fitted with operating handle and narrow base. Just right for the otherwise unreachable spots.



2 COMPACTING UNITS in twin hook-up—self-propelling. One man readily compacts up to 4000 sq. ft. per hr. in 10" layers.

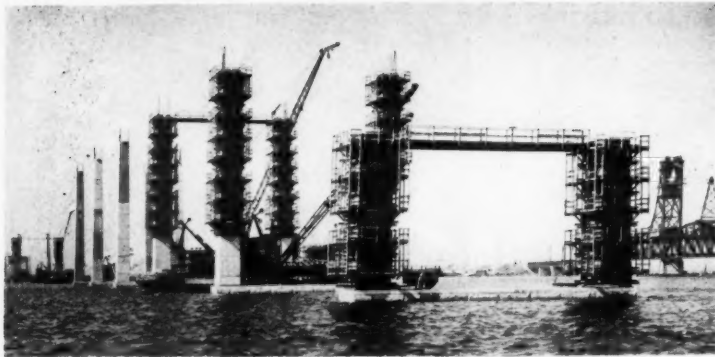
Plus UNMATCHED ON-THE-JOB ADAPTABILITY!

For consolidating granular soil sub-bases and the base courses of sand, gravel, rock or slag in waterbound and penetration macadam construction, there is just nothing that compares with the Jackson Vibratory Multiple Compactor. It not only does the straight-away work in only half the time required by equipment of other types, but is so versatile, so easily adaptable on the job that it can be used to great advantage for widening projects of any width and getting into places other equipment can not touch. As may be noted in the illustrations, any number of compacting units may be used in the workhead (up to 6, which covers 13', 3") to exactly fit the job at hand. Units may be towed at the side or fitted with operating handles and used as individual, self-propelling compactors. Quickly interchangeable bases from 12" to 26" are also available for compacting in trenches, etc.

For compacting granular soil fills of all kinds, the Jackson Multiple Compactor is a terrific cost saver and progress expediter. It's the predominant medium of consolidation used on the outstanding paving jobs in the country today. See your Jackson distributor for complete details. We will gladly furnish his name, and literature, on request.

JACKSON VIBRATORS, INC.
LUDINGTON, MICHIGAN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 294



Pier forms, of 16 and 24-foot sections, use external tie rods, making it simple for reinforcing to be placed. Forms have been stripped from the bottoms of two piers while a second pour is made.

(Continued from preceding page)

The two main piers, measuring 60 x 120 feet and going 50 feet below normal tide, required different cofferdams. These had to be braced inter-

nally with two sets that had to be lowered to elevations well below water level. The bottom set, with double wales, was erected on a support frame above water. After cofferdam sheet piles were placed around the frame

and driven to grade, the bottom set was bolted to the sheets temporarily and the support frame removed. Before the top bracing set was erected, all the bearing piles were driven inside the cofferdam and a tremie seal placed. Then the top set was erected and bolted to the sheeting, the sets were lowered into position with the help of two previously erected A-frames, and supported from the sheeting at their proper elevation by cables.

Altogether, a total of 2,568 H-beam bearing piles of 12 and 14-inch size were used in the pier foundations. All

were driven to rock in full-length sections ranging from 67 to 128 feet. Since the footings for 16 of the 21 piers were 18 feet below normal pool, the long piles stuck up out of the cofferdam after being set. A two-stage template, built to give stability to the piles, was supported from the coffer set. Setting each pile accurately was a delicate job, since the clearance between them was just enough to allow a hammer to pass as a pile was being driven. These piles were driven to the top of the template frame, swinging leads being used on battered piles and a boot bolted to the hammer for vertical piles. With this done, the template was removed and the piling driven to rock.

Below water level, piling was driven with an underwater hammer having an H-beam driving head. The last 50 feet of driving required an average of 3 blows per inch by a McKiernan-Terry 11-B-3 hammer operating at a 125-pound head of steam. At no time did the piling hang in the driving head so that it was necessary for a diver to cut it loose.

Formwork

Handling, placing, and aligning the shaft forms for the 16 approach piers was made easy by the design of the forms themselves. These were built in 16 and 24-foot sections of 3-inch sheathing with steel wales and external tie rods.

Working scaffolds were erected so that men were able to handle external tie rods and move around easily while concrete was being placed. A walkway strut connected the two shaft forms, serving to align the forms and give crew members access to either shaft. Outside guy cables also held the forms in alignment. Each form section was completely assembled before being lifted into place, eliminating the hazard of handling single panels in a small working area and at high elevations or in strong winds. Designed to stack on each other, the forms were stripped from the bottom up so that lower forms could be moved to a new location as soon as a second lift of concrete was placed.

Because the forms used external ties, reinforcing steel was set easily once the form was completely set and aligned. All reinforcing, fabricated on the job was, if possible, tied into mats before being placed. This not only reduced rig time, but also speeded the movement of forms from pier to pier.

Forms for the main pier shafts were internally rodded and had the same safety features of the other forms. The entire job of handling, setting, and removing the sections went so well that there was no lost-time-accident all during the course of the work.

Use tremie method

A floating plant with two 2-cubic-yard mixers provided the 55,000 cubic



Public Housing Project No. 1-6, Phase 1, providing 660 dwelling units for low-income families.

Architects: Hellmuth, Obata & Kassabaum, Inc.;
General Contractor: Millstone Construction Co.;
Engineer: William C. E. Becker. All of St. Louis.

**to Build in
STRENGTH
and
DURABILITY**

**...specify
LACLEDE
MULTI-RIB
REINFORCING
BARS**



The attractive apartment group pictured is one of many large-scale public housing projects for which Laclede reinforcing bars were specified. These bars, with their outstanding multi-rib deformations, conforming to ASTM specifications A-305, represent the perfect balance between high strength and maximum anchorage.



LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI

Producers of Steel for Industry and Construction

For more facts, use Reader-Reply Card opposite page 18 and circle No. 295

yards of concrete required for the piers. Aggregate and cement were delivered to the job site in barges and handled directly to the plant by a Dravo revolving crane mounted on a derrick boat hull. Derrick boats also handled the 2-cubic-yard buckets bringing concrete to the forms.

Underwater concrete was placed by the tremie method, an electric motor raising or lowering the tremie hopper as required. Seals in the 16 approach piers were made 6 feet thick, and those in the four main piers were made 11 and 12 feet thick. A leveling course from 5 to 12 feet thick was placed from the top of the tremie seal to the bottom of the granite masonry.

Hearting concrete, placed inside the granite masonry without bracing, saved time between the setting of the stone and the placing of concrete. Concrete was placed in both shafts for each pier simultaneously, the rate averaging 5 to 10 feet per hour in the approach piers and 2 to 4 feet per hour in the four main piers.

The job of placing granite masonry, subcontracted to Albert G. McGinnis, New York, N. Y., was done with all handling and storing equipment furnished by Dravo. Granite was delivered to the job via lighter and placed directly to the pier. Very little re-handling was necessary. Approach piers have five courses of stone, including the coping, while main piers have six. Two courses of stone were first placed and concreted, then the remaining courses, including the coping, were set. All joints were leaded after the hearting concrete had been placed.

THE END

Versatile hose carries air, oil, and water

■ An all-purpose hose, suitable for use with air, oil, water, and mild chemicals, has been developed by Manhattan Rubber Division, Raybestos-Manhattan, Inc., Passaic, N. J. The first all-purpose hose of mandrel-made horizontal construction, Allflex is credited with a number of advantages.

Light in weight, flexible, and non-kinking, the new hose has a controlled braid angle that helps reduce elongation and contraction. Its inseparable tube-to-cover bond increases the lift of the hose, and the cover itself is resistant to oil, heat, sun, and abrasion. Allflex comes in standard 50-foot lengths, in 3/8 to 1 1/2-inch sizes for maximum working pressures of 300 to 200 psi, respectively.

For further information, write to the manufacturer, or use the Request Card at page 18. Circle No. 105.

Wire-rope slings

■ A new bulletin features Dura-grip hand-applied slings. Various assemblies, a complete listing of dimensions, and rated capacities are included.

To obtain this bulletin write to the Wickwire Spencer Steel Division of Colorado Fuel & Iron Corp., Box 232, Denver 1, Colo., or use the Request Card that is bound in at page 18. Circle No. 61.

FEBRUARY, 1956

Diesel electric sets rated at 1,800 rpm

■ A new series of lightweight, large-capacity generating sets has been introduced by Universal Motor Co., 540 Universal Drive, Oshkosh, Wis. The new models are powered by four-cycle full diesel engines of six cylinders and are directly coupled to generators turning at 1,800 rpm.

This is a companion series to the recently announced Universal line of diesel generators offered in 1,200 rpm speed. The new 1,800 models are produced in 10, 15, 25, and 35 kw units and can be furnished with controls to meet various requirements.

For further information write to the company, or use the Request Card at page 18. Circle No. 141.

THE NEW INTERNATIONAL Model S-180 with dump body is one of a wide range of units now available in the recently announced International line. With a gross-vehicle-weight rating of 18,500 pounds, the S-180 series is available in 130, 142, 154, or 172-inch wheelbases and is powered by the 137-horsepower International Black Diamond 282 engine. An LPG fuel system is optional. For further information write to International Harvester Co., Motor Truck Division, Chicago 1, Ill., or use the Request Card at page 18. Circle No. 130.



Cold mix from stock pile being used for patching.

How To Assure Permanent Pavement Patching—Hot or Cold—In Any Season

CITY street departments as well as county and state highway departments throughout the country are becoming more and more sold on the extra value of McConaughay Weatherproof Emulsified Asphalt for pavement patching. Mixtures made with these emulsions assure superior results in any season... cold mixtures used immediately or stock-piled for future use... hot mixtures for on-the-spot patching, particularly in cold weather. You can also depend upon these emulsions for durability in application types of patching.

You can be sure of fast, dependable service on asphalt emulsions and mixes by calling any of the McConaughay Licensees listed at left. This co-ordinated group, guided by a central organization, is made up of experienced manufacturers and contractors who fully understand your problems, who offer engineering and testing services on paving materials and mixtures as well as on-the-job advice. Take advantage of this exceptional service; get in touch with your nearest McConaughay Licensee or contact...



Winter patching with hot mix.



Patching by spray application.

McCONAUGHAY LICENSEES Operating K. E. McConaughay Emulsified Asphalt Plants

1. Emulsions, Inc. Lawrenceville, Illinois
 2. Wabash Valley Asphalt Co. Terre Haute, Indiana
 3. Brookman Construction Co. 17th & Gharkey Sts., Muncie, Ind.
 4. Fauber Construction Co. Lafayette, Indiana
 5. Asphalt Materials & Construction, Inc. 960 E. 22nd, Indianapolis 2, Ind.
 6. Ready-Mix Asphalt, Inc. P. O. Box 882, Fort Wayne 6, Ind.
 7. Walsh & Ikeler R. R. #2, Gary, Indiana
 8. Bituminous Materials Co. 416 S. Water St., Jackson, Mich.
 9. Bituminous Materials Co. 318 Atlantic St., Bay City, Mich.
 10. Bituminous Materials & Supply Co. 415 Maple St., West Des Moines, Iowa
 11. Spirit Lake, Iowa
 12. Iowa City, Iowa
 13. Menlo, Iowa
 14. Doherty and Swearingen Co. 53 Main St., Yarmouth, Maine
 15. Berkshire Asphalt Co., Inc. 620 Berkshire Ave., Springfield, Mass.
 16. James Huggins & Sons, Inc. Medford & Commercial Sts. Malden 48, Massachusetts
 17. C. C. Plumb, Elmwood Station P. O. Box 65, Providence 7, R. I.
 18. C. C. Plumb Portland, Connecticut
 19. Albany Asphalt & Aggregates 75 State St., Albany, New York
 20. Knight Paving Products, Inc. 1655 Union Rd., Gardenville, N. Y.
 21. Knight Paving Products, Inc. Vine Street, Ithaca, New York
 22. Knight Paving Products, Inc. 1980 East Ave., Rochester 10, N. Y.
 23. Knight-Bitumen Corp. Watertown, New York
 24. Seaco, Incorporated 2700 Industrial Drive, Columbia, S. C.
 25. E. A. Mariani—Emulsified Asphalt Hooker's Point, Tampa, Florida
 26. Pan-Am Southern Corporation P. O. Box 2, New Orleans 6, La. (Also serving Alabama and Mississippi)
 27. Emulsified Asphalt Co. Cuttawhatchee, Kentucky
 28. Asphalt Products Co., Inc. Powell Ave., Nashville 11, Tenn.
 29. Bituminous Materials Co. P. O. Box 267, Terre Haute, Ind.
- Eastern Representative:
John A. Dow
157 Church St., New Haven 10, Conn.

SPECIFICATIONS OF THESE COLD-MIX PROCESSES AVAILABLE ON REQUEST

- 1—Penetration Macadam, 2—Open-Graded Plant Mix, 3—Open-Graded Road Mix, 4—Dense-Graded Plant Mix, 5—Dense-Graded Road Mix, 6—Mat Coat, 7—Seal Coat, 8—Sand Mix, 9—Sand Honing, 10—Patching, 11—Mastic-Mix, 12—Driveway Construction.

K. E. McCONAUGHAY
EMULSIFIED ASPHALT
Plants and Processes
LAFAYETTE, INDIANA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 296



Bituminous drainage dikes are built up along a fill by a Caterpillar No. 12 motor grader using a shop-built blade. Proper size windrows are shaped by the cut-out blade and finished by raking or luting.

Nine-mile plant-mix surfacing

Good integration of operations, and good use of equipment and crews, brought a 9-mile hot-mix paving job to completion within three weeks after work started. The job, on U. S. 85 between Torrington and Cheyenne, Wyo., was done for the Wyoming State Highway Department by three contractors. Asbell Bros. Construction Co., Riverton, Wyo., the prime contractor, did the dirt work. Mullinax Engineering Co., Sheridan, Wyo., sub-contracted crushing and asphalt work, and Northwestern Engineering Co. Inc., Rapid City, S. Dak., sub-contracted the 16,000-ton asphalt paving job from Mullinax.

The new section of two-lane highway is generally on a straight alignment, and has good horizontal and vertical sight distances, long tangent sections, easy curves, and good sub-grade construction. The granular-type subbase constructed by Mullinax is designed for axle loads of 18,000 pounds.

The paving itself consists of 2 inches of hot-mix surfacing, made with 120 to 150-penetration asphalt. Six-foot bituminous shoulders, constructed by a double penetration treatment of MC-3 and crushed rock extend 6 feet from either side of the roadway.

A design improvement is the use of built-up sections of plant-mix to create dikes and water-drainage channels along the edge of high fills. The outer 3 feet of each shoulder is on a 16 per cent slope so that the top of the dike is in the clear from roadway level. This will facilitate snow removal by clearing the edge of snow-plow blades, according to the designers. Construction of the asphalt dike was one of the more difficult parts of the job, and required special work with a contractor-rigged blade.

Portable hot plant

Northwestern Engineering Co., an experienced Rocky Mountain paving outfit, used a single plant setup about 2½ miles north of the north end of the job. A stockpile of rock aggregate had been crushed at the site by Cedarapids Master tandem crushing equipment owned by Mullinax. The paving outfit brought in a Barber-Greene portable Model 848 hot plant, consisting of a combination of new and older units.

The pugmill, dryer, and elevator for the plant were purchased from the Atomic Energy Commission after the units had been used in work in southern Idaho. Gradation and dust-collector units, however, are almost new. The plant gets most of its power from

JOY TWM-5 CHALLENGER DRILL

the BIG DRILL
that has EVERYTHING

80° DRILLING RANGE

The Joy TWM-5 Challenger will drill at any angle between vertical and 10° above horizontal, making it applicable to almost any range of drilling required.

EXTREME MOBILITY

The TWM-5 is self-propelled on either rubber tires or crawler treads. It is driven on each side by a reversible piston type air motor, can turn in its own length, and can move into and out of most "tight" spots.

REMOTE CONTROL

All functions of operation, both drilling and moving, are controlled from the operator's station on the frame, directly over the left front wheel. Three hydraulic jacks provide stability while drilling.

TM-500 DRILL

The drilling machine on the TWM-5 is the JOY TM-500, a 5¼" piston drill, which has proved itself in quarry, construction, and mining work as the first and still the leader in the big drill field. The TM-500 is mounted on an extra sturdy mast which is raised and lowered hydraulically.

ADDITIONAL FEATURES

Optional features available on the TWM-5 are a cab, designed for the best in operator comfort and protection, and a dust collection system.

Check today on the Joy TWM-5 for your drilling operation. Whether you drill vertical holes or toe holes, it will fit your program and give added rock tonnages from the day it first goes to work. Write for complete information today to Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

Write for FREE Bulletin 19-21



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Joy TWM-5 drilling deep holes (50' to 100') in granite in a southeastern quarry.

JOY

CONSTRUCTION EQUIPMENT MANUFACTURERS
FOR OVER HALF A CENTURY

For more facts, use Reader-Reply Card opposite page 18 and circle No. 297

surf done in three weeks' time

Work is done on 13-foot lane one day, adjacent lane the next; bituminous dikes serve as drainage channels along high fills

International UD-18 diesel engines.

Equipment around the plant included insulated horizontal tanks of 20,000-gallon-capacity for asphalt storage. Heat for these tanks, as well as other plant functions, was supplied by steam from a Cleaver-Brooks steam generator located upwind from the plant proper. Steam from this unit heated the asphalt tanks, did the steam-jacket insulating work, and atomized the No. 5 burner fuel used in the dryer burners.

Although the plant is equipped for a four-bin separation, a two-bin-mix separation was used on the Torrington job. A great deal of care was taken to get the desired gradation from the two-bin separation by the plant screens. The asphalt mix was based on use of the following material:

Screen	Per Cent Passing
¾-inch	100
¾-inch	60-80
No. 4	40-60
No. 10	28-42
No. 200	4-10
120-150 asphalt	6.1 by weight

The asphalt used in the mix was trucked to the job from Frontier Refining Co. in Cheyenne. Between ½ and ¼ of 1 per cent of Addathene, furnished by the Frontier refinery, was used experimentally in the mix because, according to project officials, some of the mineral filler consisted of granitic aggregates with polished surfaces that tended to strip under ordinary asphalt mixing conditions. The use of Addathene—a strip-resisting additive—was expected to make the bitumen adhere better to the aggregate, and a preliminary inspection indicated that it might be successful.

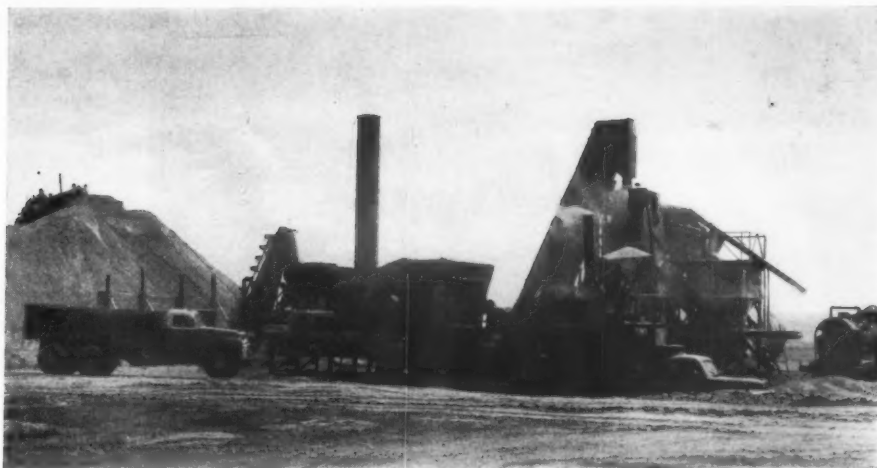
Up to 12 rented trucks were used to haul the hot-mix away from the plant. The average number, split between the 2½ and 11½-mile extreme hauls, was about 8 GMC and Ford batch trucks.

The Barber-Greene plant, a continuous-mix type, was calibrated for 120 tons per hour. This calibration was rechecked before the plant started up by state highway inspectors. In operation, the plant has turned out tonnages close to this setting. Moisture content in the aggregate pile averaged about 3 per cent.

Laydown goes fast

The hot-mix material was put down by a Barber-Greene finisher with screed extensions enabling it to place a 13-foot lane. Material was spread for a final compacted thickness of 2 inches in a single course. The first 13-foot lane was placed as far as a day's

(Concluded on next page)



One of the batch trucks stands by as another is loaded at the Barber-Greene Model 848 asphalt plant. Using a 2-bin-mix separation, the plant is calibrated to turn out 120 tons of material per hour.

Utilities pipeline contractor

Averages 20 feet of trench per minute, digs 2 to 4 jobs per day with each of his Clevelands

1000 feet of complete pipeline construction—trench digging, pipe-laying, backfilling and backfill compaction—is an average day's work for each crew of F. H. Linneman, Inc., pipeline and utilities contractor of Denver. Most of this work is on 2-, 4- and 6-inch pipelines for the many new housing developments in the Denver area.

With a Cleveland Trencher opening up trench at an average rate of 20 feet per minute, a typical Linneman crew will do 2, 3 or 4 complete pipeline jobs in an 8-hour day—jobs that run from 50 to 1000 feet each in length. One of these crews has a record day's production of 7 complete jobs.

Currently operating 7 Cleveland Trenchers, Linneman specializes in utilities work—gas, water and sewer line construction. Equipment-minded and especially maintenance-conscious, he has consistently employed Clevelands ever since he began his contracting business in 1946.



Fast portability of equipment is essential in Linneman's tight-scheduled operations. His Clevelands can be loaded on their low-bed trailers in less than 10 minutes time, ready to roll safely from job to job at legal limit speeds.



"Maintenance costs on Clevelands are appreciably lower" says owner of 7

Here is what F. H. Linneman has to say about trenchers:

"In the type of work we most generally perform, in the city especially, we have found Clevelands best suited to our operations because of their narrow-width construction, compactness and speed. They enable us to work in close places and keep trenching ahead of follow-up operations, a decided advantage.

"We have employed Clevelands in our work since we began contracting in 1946. We have seven of them at the present time, the oldest being a Cleveland Model 95 purchased in

1948. We have no record of the miles this machine has dug, but feel that it would be a near-record. Our maintenance costs on it have been extremely low.

"Our over-all maintenance costs on Clevelands are appreciably lower than on other trenchers we have operated. This is another reason why we have purchased more Clevelands than any other make. We have also found it easier to train operators for Clevelands than for any other make. Our newest Cleveland, a "240," was delivered only last week by H. W. Moore Equipment Co., here in Denver."

THE CLEVELAND TRENCHER COMPANY • 20100 St. Clair Ave. Cleveland 17, Ohio



CLEVELAND

For more facts, use Reader-Reply Card opposite page 18 and circle No. 298



The Barber-Greene finisher puts down one 13-foot lane of bituminous material in a day's run. The following day, the adjoining lane will be put down and the longitudinal joint rolled immediately.

(Continued from preceding page)

run would take the crew, the highway center line being marked off with twine. The next lane was jammed up tight against the first, and the longitudinal joint was rolled immediately to eliminate a division of the surface at that point.

Initial breakdown rolling was done by a Galion 6 to 8-ton tandem roller. A Buffalo-Springfield 3-axle tandem steel-wheel machine developed good densities on the finish rolling, which was done a half mile or more behind the laydown crew.

Shoulder work

Construction of the 6-foot shoulders and asphalt dikes was the most difficult part of the job. The double-

asphalt penetration was done by a new Rosco asphalt distributor, which was blocked off far enough to give the required 6-foot width. The first course consisted of an application of MC-0 that sealed the subbase surface. A course of 3/4-inch-minus crushed rock was then laid on the shoulder and given an application of MC-3. This process was repeated to complete the penetration treatment.

To construct the bituminous dikes, the company made a special blade for its Caterpillar No. 12 motor grader. This blade had a cut-out section, designed to shape the proper-size windrow. After the proper amount of material had been dumped by batch trucks, it was moved to its approximate location with the conventional blade of the No. 12 grader. The special blade was then bolted on the grader, which made one or two passes to shape the windrow properly. Some raking and luting followed to shape the dikes properly.

Throughout the project there was excellent control of all bituminous mixes. A field laboratory was established on the job, where sampling was done daily—or oftener if necessary—on aggregate gradation, asphalt content, and densities on the finished oil mat. Bin checks and oil-yield checks on the plant were also made.

While the job did not present innumerable problems to the contractor, he had his share of them. One involved the few rented batch trucks with corrugated beds that were used for a short period of time. When diesel fuel was used to wash down the beds, enough dammed up behind the corrugations to ruin several places in the finished pavement. These sections, of course, were cut out and replaced with good material.

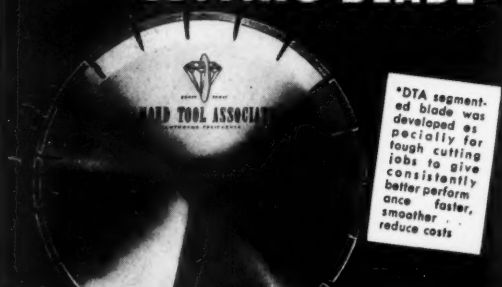
The project was under the general supervision of A. G. Gardner, district engineer, assisted by A. L. Putnam, project engineer. General superintendent for Northwestern Engineering Co. was T. C. Ledgerwood, who was in charge of all field paving work.

THE END

To do this CUTTING JOB BETTER-



You need this CUTTING BLADE-



And this CUTTING MACHINE-



and of course **DTA*** they're both

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For more facts, circle No. 299

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- detailed descriptions of the operations an excavating contractor must perform on literally hundreds of different jobs
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For more facts, circle No. 1

Oil filters and refills

■ The complete line of oil filters and refills manufactured by Champion Laboratories, Inc., is detailed in a catalog from the company. A Champ cartridge cross index lists the filters for prominent makes of equipment. There is a 12-page chart of refills for trucks, tractors, and other machines.

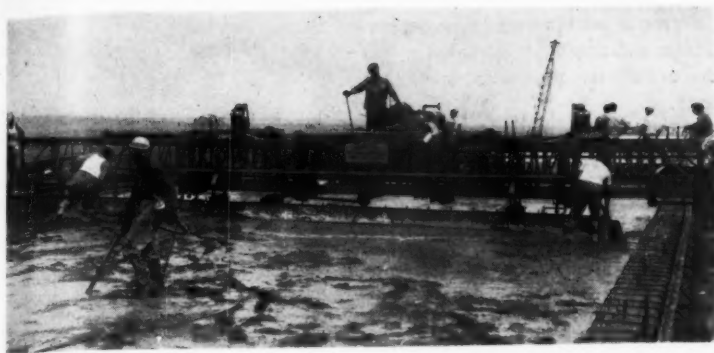
To obtain this catalog write to Champion Laboratories, Inc., Meriden, Conn., or use the Request Card at page 18. Circle No. 12.

Cranes and derricks

■ Three catalogs on steel derricks, hoists, and Whirlleys have been issued by the Clyde Iron Works, Inc., Duluth 1, Minn. Action shots, tables of sizes and capacity, flow sheets, pictures of equipment, and the particular advantages of each model are given in the catalogs.

To obtain these catalogs write to the company, or use the Request Card at page 18. Circle No. 15.

CONTRACTORS AND ENGINEERS



New equipment joins line of concrete paving items

Mechanical curb-builders, self-widening finishers, spreaders, bridge-deck finishers, and a newly-developed flexible-radius form are among the new items of concrete-paving equipment placed on the market by General Road Machines, Inc., Niles, Ohio.

An innovation in such equipment is the self-widening finishers equipped with 16-inch-wide screeds and 6-speed transmissions. A simple control permits the machine operator to widen or narrow the width of the rig as concrete is being finished, particularly at interchanges.

Also self-widening is a bridge deck finisher that can be adjusted from 24 to 36 feet. Riding on special rails, this rig uses suspended screeds to finish concrete.

Mechanical finishing of roll-type curbs is provided by a new curb-builder that eliminates, to a large extent, the hand labor formerly required for this work. The machine works in tandem with the GRM offset screed finishing machine which eliminates carry back of concrete.

The GRM spreader, scheduled for production next month, is a light and fast rig that distributes concrete evenly between forms by means of three hydraulic paddles that are independently controlled. The spreader has four traction speeds, forward and reverse, and can easily be adjusted for various widths.

The new General flexible radius forms, incorporating hinged joints on 1-foot spacing, are designed for inside and outside radius work and serpentine curb construction.

For further information write to the manufacturer, or use the Request Card that is bound in at page 18. Circle No. 107.

Five booklets on aluminum for construction use

Five new booklets offering up-to-date information on aluminum architectural and building products have been released by the Aluminum Co. of America.

The booklets are: "Wall Systems of Alcoa Aluminum", "Aluminum in Architecture", "Aluminum Products for Industrial Construction", "Aluminum Roofing and Siding Products", and "Aluminum Industrial Building Products".

To obtain this literature write to the Aluminum Co. of America, Room 773, Alcoa Bldg., Pittsburgh 19, Pa., or use the Request Card at page 18. Circle No. 119.

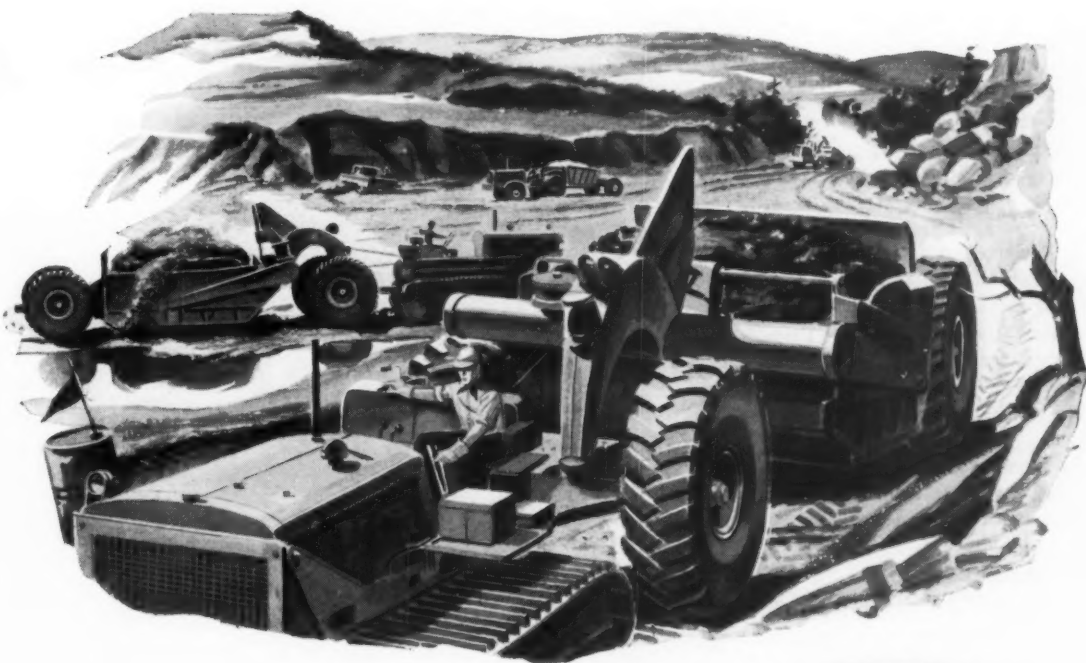
Above, the new GRM self-widening bridge-deck finisher. Particularly valuable at interchange construction is the self-widening finisher, right, made by General Road Machines, Inc. It can be adjusted while it is operating.



NOW...THE ALL-NEW, ALL-DUTY

GENERAL L. C. M.

with stronger-than-steel **NYGEN® CORD!**



Featuring crawler-like traction and flotation

GREATEST ever developed by tire engineers, this rugged new General L. C. M. more nearly approaches ideal crawler-like flotation and traction than any other tire.

BUILT with opened-up tread design, the L. C. M. is truly an all-duty tire for all type operations. Reduced rolling resistance increases tread life.

EXCLUSIVE stronger-than-steel Nygen Cord provides the new General L. C. M. with maximum protection against breaks, growth and damp rot.

WIDER, heavier tread with deep-drive cleats protects sidewalls against costly cuts and snags... puts more rubber on the ground for less stress per-square-inch.

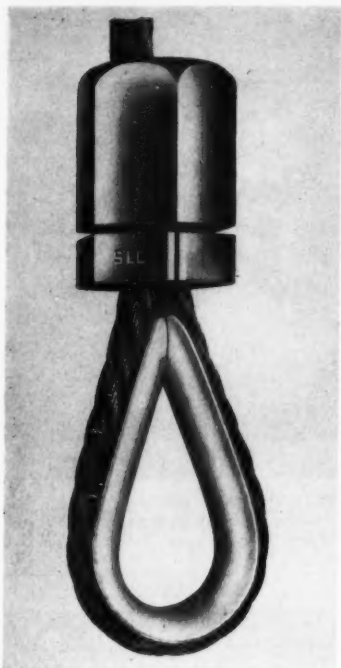


THE GENERAL TIRE & RUBBER CO.

AKRON, OHIO

Specify GENERAL Tires on your new equipment

For more facts, use Reader-Reply Card opposite page 18 and circle No. 301



The new Lamson & Sessions mechanical wire-rope clamp can be assembled easily.

Wire-rope clamp is easily assembled

■ A new mechanical wire-rope clamp that can be assembled as easily in the field as in the shop is available from the Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.

Known as the Lamson Safe-Line Clamp, the unit is made in two halves that are grooved on the inside to hold the rope. As the unit is tightened, the halves come together in a solid, dependable grip. The Safe-Line Clamp holds wire rope with a positive grip, since the elastic "rubber band" action adjusts to changes in stress and creeping in the rope.

Because the clamp has fewer parts than most similar units, replacement costs are reduced. The clamp can also be assembled quickly with a vise and wrench.

For further information write to the company, or use the Request Card at page 18. Circle No. 110.

Non-shrink mortar

■ A seven-step procedure for repairing roadways with Embeco premixed mortar is described in a folder from The Master Builders Co. Each step is described and illustrated with a photograph. The literature points out that the mortar bonds tightly to old concrete and has high compressive and flexural strength.

To obtain this folder write to The Master Builders Co., 7016 Euclid Ave., Cleveland 3, Ohio, or use the Request Card at page 18. Circle No. 59.

Tractor sweepers

■ M-B Corp.'s Model 8N and NA sweepers for mounting on Ford 8N, NAA, 600, and 800 tractors are described in a mailing piece. The units may be used for sweeping snow, cleaning off black topping, and maintaining industrial areas. Specifications and optional equipment are listed.

To obtain this sheet write to M-B Corp., New Holstein, Wis., or use the Request Card at page 18. Circle No. 18.

Concrete-breaking tool

■ A pneumatic tool accessory for concrete breaking, the Sabur Point, is detailed in a folder from Brunner & Lay, Inc. According to the manufacturer, the tool's curved blade sets up a wedge action which shatters the concrete, while the tapered point rides free during the breakage to penetrate the concrete.

To obtain this folder write to Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill., or use the Request Card at page 18. Circle No. 26.

Detroit Diesel appoints

Robert E. Hunter has been appointed general sales manager of the Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich.

Formerly sales promotion manager, Hunter will now be in charge of division advertising, promotion, and publicity.

Positive locking action in new-type safety hook

■ A Swedish-made crane hook incorporating a positive-lock safety hook of new design is imported and offered in this country by The Walpole Co., 419 Boylston St., Boston, Mass.

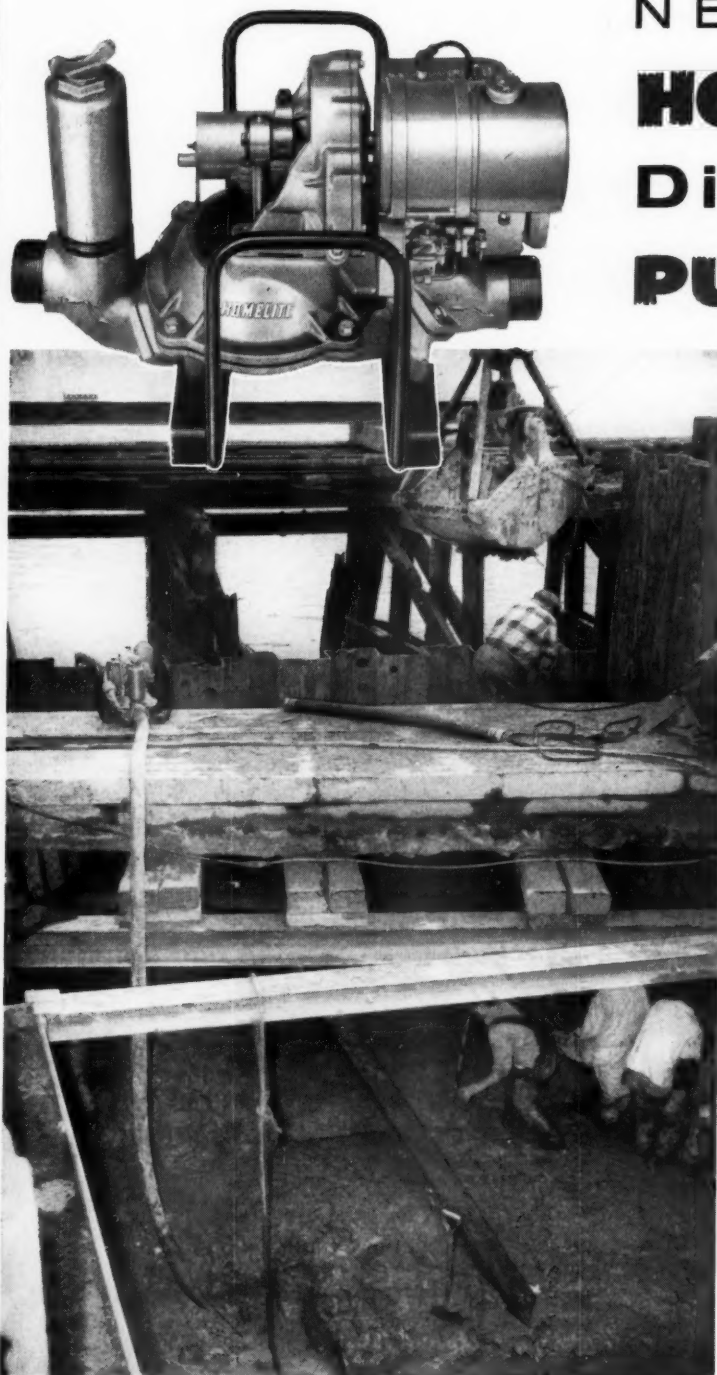
Not a snap hook, the drop-forged high-strength chrome-nickel steel hook embodies the safety feature in its design. When the hook is closed it completely encloses the sling. The hook is held closed by a safety catch. According to the company, the hook cannot open while in use—even under



a swinging load.

The safety hook is available in two capacity sizes—3-ton and 10-ton.

For further information write to the company, or use the Request Card at page 18. Circle No. 92.



NEW HOMELITE Diaphragm PUMP

for All Heavy-Duty jobs*

This new, job-tested Homelite diaphragm pump will handle *all* your heavy-duty jobs with greater ease and mobility.

Its new internal design not only pumps up to 5000 gallons per hour but handles sand, mud, solids and muck with equal ease. Because it weighs only 120 pounds, it goes anywhere quickly and easily . . . saves money in labor and haulage costs.

The entire unit construction is keyed to smooth, continuous performance. Flapper valves have special self-cleaning action to prevent clogging. The accumulator holds flow at a steady rate. Gears are totally-enclosed for full protection. Spring skids provide steadier footing, reduce vibration.

Write or call your nearest Homelite representative for complete information or a free demonstration.

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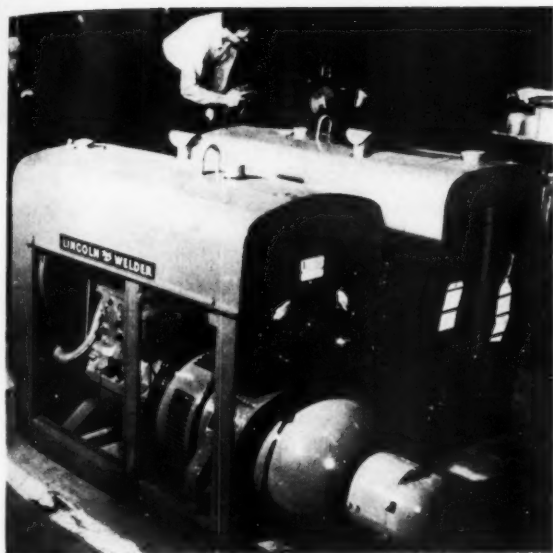
*120 pounds for easier carrying

Model 20DP3 has guaranteed suction lift up to 28 feet and total head up to 50 feet, including friction.

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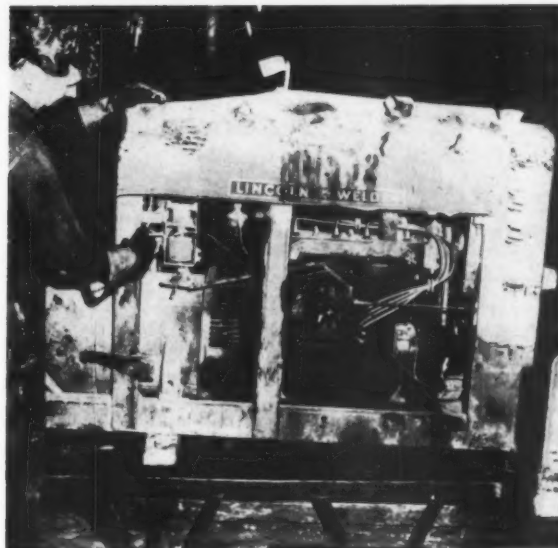
For more facts, use Reader-Reply Card opposite page 18 and circle No. 302

CONTRACTORS AND ENGINEERS



New-machine looks and performance are the results of the Lincoln Electric Co.'s remanufacturing of the old welder.

(See descriptive item in column 2)



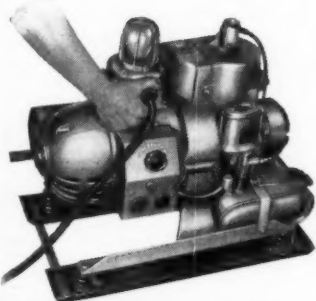
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Complete line of saws with clearing and
brushcutter attachments for every
woodcutting job.

HOMELITE

A DIVISION OF TETRON AMERICAN, INC.
PORT CHESTER, N. Y.

For more facts, circle No. 303

FEBRUARY, 1956

Remanufacturing service restores old welders

■ The Linconditioning Division of the Lincoln Electric Co. offers a remanufacturing service for old welders that is guaranteed to give new-machine performance and a full-service life to the units. Done on a production-line basis, the process costs half that of the production of a new machine.

Many companies, Lincoln indicates, are supplementing normal preventive-maintenance measures with planned programs to bring older welders up to peak efficiency.

For further information write to the Lincoln Electric Co., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 108.

Pressure-treated timber

■ Pressure-treated timber highway guard posts are low in first cost and require no maintenance, according to a new design-guide folder issued by the Western Wood Preserving Operators' Association. The association has its headquarters at 1410 S. W. Morrison St., Portland 5, Oreg.

The publication describes the sawn-timber, treated guard post developed through research by the association and now adopted by most highway departments in the western states.

Lower transportation costs, easy alignment, no painting, less settling in soft grades, high strength in relation to weight, easy installation and adaptability to any type of guardrail are among advantages listed.

To obtain this literature write to the association, or use the Request Card at page 18. Circle No. 143.

Vibratory compactors

■ A new booklet from the Iowa Mfg. Co., Cedar Rapids, Iowa, describes and illustrates the Models 25 and 60 Cedarapids vibratory compactors. Actual job photos show the rubber-tire units in action.

Specifications and price charts are also included, along with a discussion of the principles of soil compaction.

To obtain Bulletin Comp-4 35M 5-53 write to the company, or use the Request Card at page 18. Circle No. 118.

LORAIN'S NEWEST MOTO-CRANE

LORAIN
DIXIE



3/8-YD.

HOE
SHOVEL
CLAMSHELL
DRAGLINE

6-TON
CRANE

TRAVELS UP TO 45 M.P.H. LOW IN PRICE — HIGH IN QUALITY

Here is Lorain's answer to your need for a low-priced 3/8-yd. shovel-crane-drag-clam-hoe on rubber tires. Here is a bargain buy in a husky, quality design that cannot be overlooked by any contractor, large or small. Check the big-machine Lorain-Dixie features below. Compare these features with other 3/8-yd. shovel-crane. You can mount the Lorain-Dixie on a Lorain designed and built Moto-Crane Carrier or on two other lower-priced factory mountings that are also available. Also, the Lorain-Dixie turntable may be mounted on one of your own commercial trucks.

Here are a few of the features that make the Lorain-Dixie the biggest bargain in its class: Economical in first cost and operating cost—uses only one gallon of fuel per hour • "E-Z" Hydraulic controls • No mechanical clutch linkage to wear • 5 interchangeable hydraulic clutches • Clean-cut, simple, open and accessible machinery layout • Heavy, rugged construction • All horizontal power shafts on anti-friction bearings • Independent boom hoist • 4 sets of top rollers and adjustable bottom hook rollers • Machine-cut teeth on all spur gears.

For convincing proof, see your nearby Thew-Lorain Distributor for full details and a demonstration. Or, write direct for new Lorain-Dixie Catalog to . . .

THE THEW SHOVEL CO., LORAIN, OHIO

THEW **LORAIN**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 304



Students operate International TD-18A's, a tractor-scraper combination, and a Galion motor grader as they head out to a job on the 71-acre work site at the school.

From construction "rookie"

Though training courses for equipment operators are not new, most of them have been organized by equipment manufacturers or dealers. Going one step further is the National School of Heavy Equipment Operations near Charlotte, N. C., which offers would-be operators a choice of three courses covering equipment operation and maintenance, and all kinds of new machinery to tear up the 71-acre "campus."

Started last March with a total student enrollment of nine, the school turned out 130 operators in nine months and has been fully booked with 35 students for each semester since then. The school was started by Gilbert S. Shaw, and according to him, 90 percent of all men completing the four-week course have been hired by contractors. Sometimes, contractors come around, giving students job interviews even before the men have finished the course.

The well-staffed school now has more than a quarter of a million dollars invested in land and equipment, most of the latter supplied by A. E. Finlay & Associates of Charlotte and several equipment manufacturers. A group of civic and religious leaders serve on the board of advisors.

Representative of the student body are Clyde and Ivey Hull of Morganton, N. C., brothers who couldn't tell a tractor from a motor grader and had to be taught earthmoving from a standing start. Clyde, a 27-

Spreads 400 tons of road base per hour ... with help of 100 TIMKEN® bearings

THE Blaw-Knox Model P-150 Base Paver shown below can spread road base material of all kinds, ranging in size from dust to 5 inches, at a rate that averages up to 6½ tons a minute.

The 100 Timken® bearings used on the P-150 are one of the main reasons this 12-ton machine operates smoothly and without breakdowns. Timken bearings practically eliminate friction. For two reasons: a tapered design that is geometrically correct to produce true rolling motion, the answer to friction; and manufacture that lives up to the design. We even make our own steel.

It's the only way we can be sure it's good enough for Timken bearings. We're the only U. S. bearing maker that does.

One Timken bearing application in this machine illustrates several of the reasons Blaw-Knox uses so many. Timken bearings on the eccentric that oscillates the screed take severe radial and thrust loads. Because of their tapered design, Timken bearings can take any combination of radial and thrust loads. And they take heavy, rapid shock loads—because rollers and races are case-hardened to provide a hard, wear-resistant surface over a tough,

shock-resistant core. Timken bearings require little lubrication, minimum maintenance, because they keep shafts and housings concentric, make closures more effective. Lubricant stays in and dirt out.

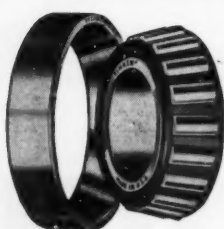
All these advantages and more are yours when you specify the bearings with the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



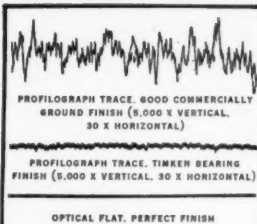
This symbol on a product means its bearings are the best.



BLAW-KNOX uses 100 Timken bearings on the P-150 Base Paver to get long life, low friction, little maintenance.



TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



SMOOTH TO MILLIONTHS OF AN INCH

Surface finish of high quality Timken bearing rollers and races is so smooth that it takes a profilograph to measure its smoothness. This instrument measures surface variations to a millionth of an inch, as shown at the left.

NOT JUST A BALL — NOT JUST A ROLLER — THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

For more facts, use Reader-Reply Card opposite page 18 and circle No. 305

Eagle BREAKER BALL DELIVERS THAT "SUNDAY PUNCH" FOR THE ALABASTER LIME CO.

ALABASTER, ALABAMA



The 3000 lb. breaker ball shown readily breaks high calcium limestone to 25" x 40" crusher size. Ask for Bulletin 955—describes breaker balls of Ni-Hard for toughest jobs and semi-steel for regular jobs—1500 to 8000 lbs. Easily replaced hook. Spherical drop balls in 6 sizes.

Send for Bulletin 1255
on EAGLE PILE HAMMERS.



For more facts, circle No. 306
CONTRACTORS AND ENGINEERS

Bookkeeping equipment operators

That's the record of a new school turning out the trained men needed by earthmoving contractors



In a half-hour classroom session that starts the day, students get a working knowledge of components of the International TD-18A track frame.

year-old former insurance salesman, and Ivey, a 25-year-old ex-GI, first learned of the school through a want ad in a local paper. Wanting to get into the industry as equipment operators, they paid their \$250 tuition, picked their four-week course, and went right to work.

Like other students, they lived in comfortable and clean quarters at the school, paying \$11 per week for their room and board. For almost two-thirds of the 218-hour course, they were in the field, either operating equipment or watching it work. The remaining one-third of the course they spent in classroom sessions, learning the theory and fundamentals of equipment operation and maintenance, and taking both oral and written tests. In the field, they put their theoretical knowledge to work, using new track-type and wheel-type tractors, motor graders, and shovels to learn to build roads, knock down trees, bulldoze, dig ditches, do dam work, and other types of earthmoving.

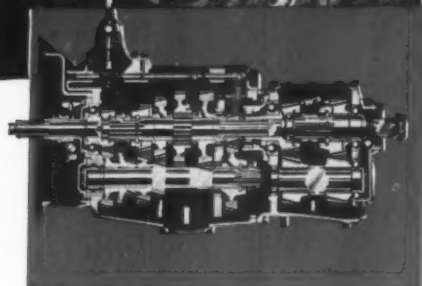
Both brothers now have their diplomas, but admit they still have a lot to learn. Married men with families, they soon hope to land jobs working for a contractor overseas, where the higher wage scale is a big attraction.

The school itself is doing so well, supplying contractors with needed and trained personnel, that its founder is planning to open another, probably on the west coast. THE END

*This job was done
Quicker, with Less
Downtime...*



*...and at lower cost because
38 FULLER Transmissions
delivered the horsepower!*



Model 10-F-1220 Transmission

On the three sections of the Ohio Turnpike totaling 12.1 miles near North Royalton, Ohio, for example, the Cook Construction Company of Jackson, Mississippi, used 8 of these 14TDT Euclid Motor Scrapers of 18 yard capacity, equipped with 10-speed Fuller 10-F-1220 Transmissions to speed up the earthmoving. The scrapers are powered by NHS 600 Cummins 275 hp engines.

Cook Construction also used 30 Model 4FDT Euclid Bottom Dumps with Fuller 5-A-920 Transmissions, powered by Cummins NH 200 hp

engines, in moving the 6,000,000 yards involved.

Says P. E. Maxsween, Equipment Superintendent: "Whenever I have a choice I *always* specify Fuller Transmissions because I like the way they stand up on the job." Maxsween also likes Fuller Transmissions because they get the job done faster, more efficiently, at less cost and with less downtime.

Cook Construction Company, subcontractor to T. L. James Company of Ruston, Louisiana, on the Ohio Turnpike job, has moved the Fuller

Transmission equipped earthmovers to a section of the Kansas Turnpike near Wichita, for which they are prime contractors.

In Kansas, as in Ohio or elsewhere, Fuller Transmissions are putting horsepower to work, efficiently . . . profitably.

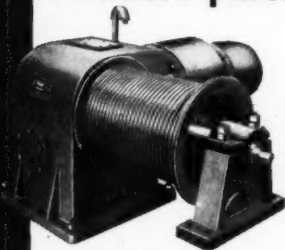


FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 308

**BUILT TO YOUR
needs from
standard parts**



15-HP SPECIAL
PURPOSE HOIST
single fixed drum, worm gear drive

Meet your hoisting needs *precisely* at lowest possible cost. Call on our long experience in modifying and re-combining standard parts to meet specialized hoisting requirements.

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MUNDY CORPORATION**

Main Office and Works:
SUPERIOR, WISCONSIN, U. S. A.
New York Office, 7 Day St., N. Y. 7, N. Y.

For more facts, circle No. 307

FEBRUARY, 1956



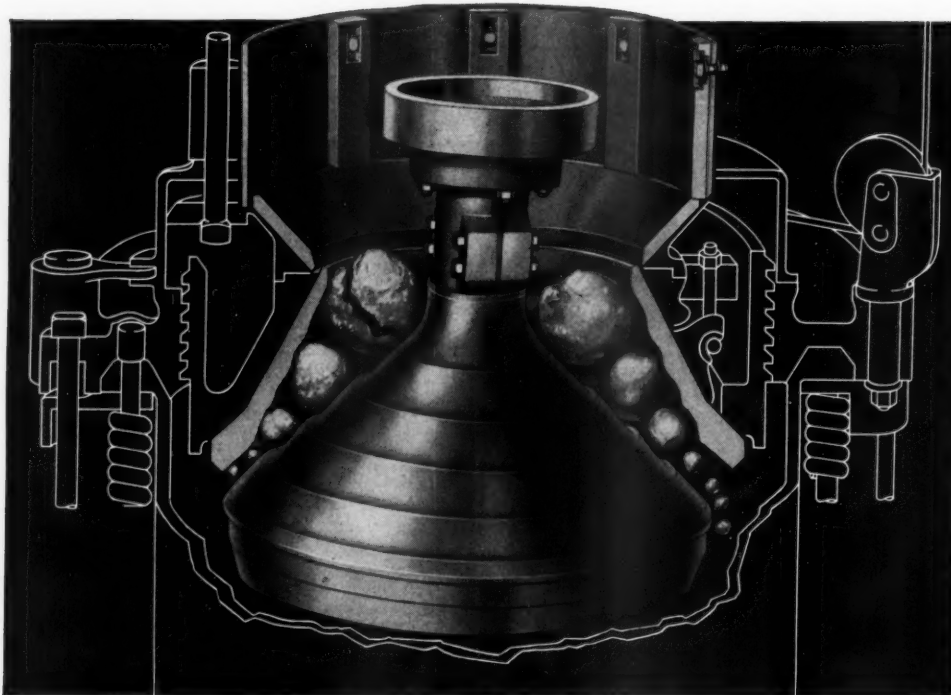
ONE OF THE NEWER construction jobs, the building of Nike launching sites, is started at Hamburg, N. Y., by a Lorain 85 hoe with 60-inch dipper. Digging through 22 feet of solid shale and rock, the rig averages 200 to 225 tons of material per hour. Total excavation for the site comes to 23,000 cubic yards.



IN A ROCKY SECTION of the Kentucky Turnpike right-of-way, a Euclid 22-ton rear-dump truck is loaded with blasted rock by a Bucyrus-Erie 71-B shovel. The work is being done by Codell Construction Co., Winchester, Ky., which holds the contract for one of the larger stretches.

AMSCO® CRUSHER PARTS

"give" a little to
TAKE MORE PUNISHMENT



Amsco crusher parts are made of the toughest steel known—manganese steel. Typical of the Amsco line are the mantle and bowl liner in this sketch of a Symons® Cone Crusher. Symons is a registered trademark of Nordberg Manufacturing Company.

Under the violent crushing forces of impact, abrasion and pressure, the surface of Amsco manganese steel crusher parts work-hardens to as high as 500 Brinell. Yet beneath the working surface, the metal remains strong and ductile... able to *give* slightly under crushing forces... developing hardness as a new working surface is exposed by wear. That's why manganese

steel crusher parts last so long, enduring severe abuse and resisting cracking or chipping even when worn thin.

Amsco makes manganese steel crusher parts for most manufacturers of crushing, grinding and pulverizing equipment. Buy your replacement parts from your crusher manufacturer to be sure of getting Amsco manganese steel.

Amsco also produces other alloy steels with maximum wear resistance under particular service conditions.



AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 309

BPR issues annual report

An illustrated discussion of the factors affecting progress in the national highway system during 1955, has been released by the Department of Commerce, Bureau of Public Roads. The booklet discusses such subjects as the federal-aid program, the national system of interstate highways, improvement in highway design, repair of flood-damaged roads, research and safety activities, and financial programs.

"Annual Report, Bureau of Public Roads, Fiscal Year 1955," also contains a series of tables showing a state-by-state breakdown of the apportionment of federal funds, those projects started and those completed during the year, and improvement projects.

The book may be obtained by writing to the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. The cost is 25 cents.

DUDGEON HYDRAULIC JACKS

**SALES
RENTALS**

FOR:

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- BRIDGES
- PIPE PUSHING
- SOIL TESTING

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TO
400 TONS**



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Hydraulic Units For Special Applications

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For more facts, circle No. 310
CONTRACTORS AND ENGINEERS



UNDER PENNSYLVANIA'S PROGRAM for widening existing highways, this Blaw-Knox 95 road widener tackled jobs on three routes near Indiana, Pa. Vern Sherwin, Somerset, Pa., uses a Chevrolet truck to keep the widener supplied. When the job is finished, the highways will be given a bituminous surface.



DIGGING INTO A 25-FOOT-DEEP BANK, a Bucyrus-Erie 150-B with 6-yard dipper loads Euclid and Kenworth trucks hauling material two miles to a fill across San Francisco Bay, Calif. Bettering the daily requirement of 10,000 yards, Guy F. Atkinson Co., South San Francisco, is moving up to 13,000 yards every day.

Bulletin is issued on engineering geology

The quarterly bulletin of the Colorado School of Mines, entitled "Engineering Geology", discusses the subject from the standpoints of historical development, scope, and utilization.

Written by George A. Kiersch, Geol. E., Ph.D., associate professor of geology at the University of Arizona, Tucson, the book is divided into four parts: the fundamentals of engineering geology; engineering structures and their geologic problems; geologic processes, materials, and fields related to engineering geology; and techniques, interpretation, and presentation of data.

A bibliography and appendix are also included.

Priced at \$1.50, the book is available from the Colorado School of Mines, Golden, Colo.

A calendar of coming conventions, of interest to our readers, appears on page 126.

NOTICE TO BUYERS OF NEW ROTARY SWEEPER BROOM CORES

We Manufacture NEW Cores of the following types:

★ LITTLEFORD ★ DETROIT-HARVESTER
★ HOUGH ★ GRACE ★ ROSCO
★ FORDSON ★ SPEARSWELL ★ LULL
★ HUBER ★ MELI-BLUMBERG

(Special Cores Made to Order)

We Rebuild Repair all Makes Types- Sizes



Immediate Shipment SAVE MONEY

Suggestion! Buy Cores without any filling or we can furnish filled with steel spring wires—Bass—Palm or Hickory Fibres.

ROAD BUILDERS IT'S SENSATIONAL!

BIG PECKERWOOD BIG

Steel (or Fibre) road drag levelers Made in any c-o-n-t-i-n-u-o-u-s length up to 12 feet. 6 inches wide—kiln dried hardwood

NO FRAME REQUIRED

We offer also (not illustrated) The LITTLE PECKERWOOD unit steel wire drag 3" x 15". Fits standard frame

Road Contractors Headquarters Since 1928
VAN BRUSH MFG. CO., INC.
327 Southwest Blvd., Kansas City 8, Mo.

For more facts, circle No. 311

FEBRUARY, 1956

DEMPSTER DIGGSTER GRD-101

....only front end loader or small shovel of its type with bottom dumping bucket!



HERE IS A SMALL SHOVEL and front end loader that is fully operated by hydraulic power with independent crowd and hoist action—an excavator and loader that needs no wheel traction. It is the only shovel of its type featuring bottom dumping bucket—emptied completely and instantly!

Hydraulic crowd and hoist moves bucket out-and-up to follow contour of material—getting a full load with every stroke. This reduces both loading time and idle truck time to a minimum. Thus, gets the job done faster!

The Dempster-Diggster is the only small shovel that offers you all the important features of big shovels . . . Simultaneous and Independent Crowd and Hoist . . . Hydraulic Crowding . . . Hydraulic Hoisting . . . Variable Crowd Action at any Dipper Position in addition to Changeable Bottom Dumping Buckets for digging or loading. Write for complete facts on this revolutionary, power-packed hydraulic shovel. A product of Dempster Brothers, Inc.

DEMPSTER BROTHERS, 4125 Shea Bldg., Knoxville 17, Tenn.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 312

Above Dempster-Diggster GRD-101 is equipped with 1½ cu. yd. loading bucket for materials-handling. Photo below shows Dempster-Diggster GRD-101 excavating with 1 cu. yd. bucket with four teeth.





NOT QUITE HISTORIC, but important enough to make workmen pause, is the arrival of two 7-foot-long segments for the tunnel ring that will straddle the New York-New Jersey state line in the third Lincoln tube. These and 12 other segments making up the ring that will lie 97 feet below the river surface, were lowered



into a 60-foot construction shaft in Weehawken, N. J., and delivered to the bulkhead. Above, segments ride on a rail car as they go into the materials lock and pass from the free-air portion of the tunnel to the compressed-air section just ahead of the bulkhead.

New book discusses treated timber piles

The use of treated timber piles in the foundations of heavy buildings, bridges, seawalls, viaducts, and overpasses is discussed in a new book, "Pressure Treated Timber Foundation Piles." Case histories and inspection reports document statements made in the text, and pertinent foundation details of important structures in the U. S. are given.

Single copies of the book are available free to architects, engineers, and builders from the publisher, American Wood Preservers Institute, 111 W. Washington St., Chicago 2, Ill.

New Marion sales team

The Marion Power Shovel Co., Marion, Ohio, has placed Dean Calland at the head of a new sales organization working in the southwestern part of the United States. He will be assisted by T. R. Fogelberg and E. J. Riggs.

Riggs will cover the states of Arizona and Utah, and parts of Idaho, Nevada, Wyoming, and New Mexico. Southern California is the territory assigned to Fogelberg.

Blaw-Knox staff changes

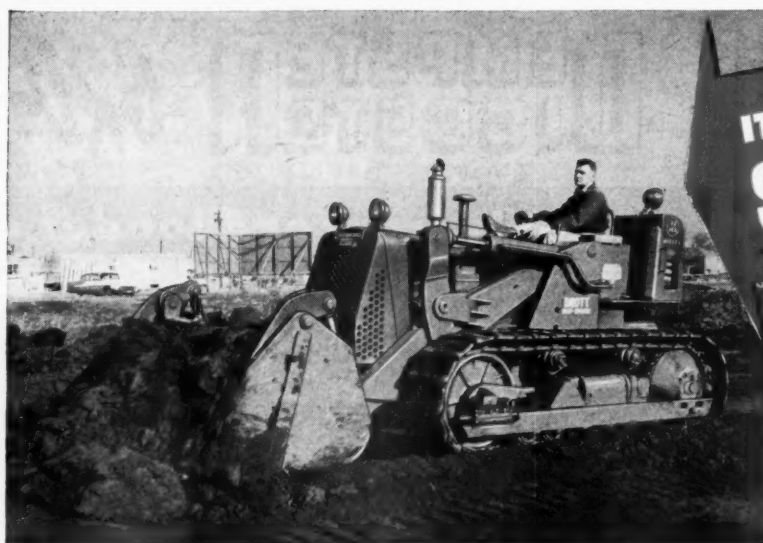
William E. Parfitt and M. N. Ornitz have been promoted to the posts of division managers of the Blaw-Knox Co., Pittsburgh, Pa. Parfitt had been sales manager of the Power Piping & Sprinkler Division, and Ornitz, works manager of the National Alloy Division.

Vice president N. B. Ornitz has retired from active duty with the firm. With Blaw-Knox since 1929, he had been in charge of both the National Alloy and Power Piping & Sprinkler divisions.

American-Marietta buys Keystone Lime Works

The American-Marietta Co., manufacturer of paints, resins, and building materials, has acquired the Keystone Lime Works, Keystone, Ala.

The operations of the Keystone plant will be consolidated with those of the Southern Cement Co., Birmingham, Ala., a division of American-Marietta.



IT'S A
Skid-Shovel

with Drott's exclusive triple-power, pry-over-shoe break-out action—plus 42° ground-level bucket roll-back! The Skid-Shovel position also gives you speedy straight-forward loading—time-gaining, strain-saving Skid-Shoe load transport!

EXCLUSIVE NEW 2¼-YARD
gives you 4-machine utility ...



IT'S A
Clamshell

a "wide-opener" that gives you a speedy bucket-fill on stockpiled loose materials, even in cramped quarters. And as a clamshell, the Four-In-One gives you a 30-inch dumping height advantage over ordinary roll-forward bucket dumping.

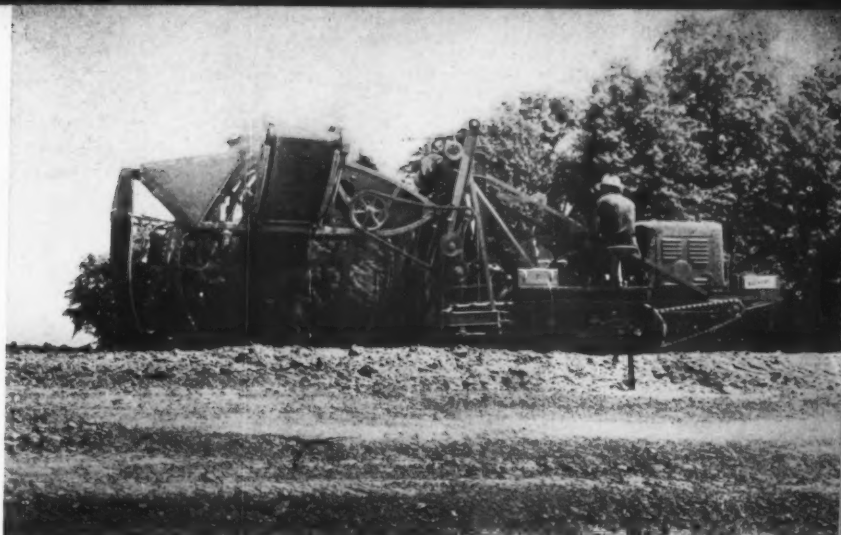


Move the Four-In-One "machine-selector" lever with finger-tip ease, and prove *versatility unlimited*... get the job-range of a machinery yard full of costly, limited-duty rigs! Test the tremendous excavating power of exclusive pry-over-skid-shoe break-out

action. Compare how exclusive shock-swallowing Hydro-Spring speeds production, protects performance. Try this big new 2¼-yard Four-In-One, or the TD-6 one-yard or TD-9 1½-yard model. Ask your nearby International Drott distributor for a demonstration!



EARTHWORK NEARS THE FINAL STAGES for the new \$1,727,000 senior high school being built in New Canaan, Conn., as an Allis-Chalmers HD-10 helps in the grading operations. Monaco Construction Co., Bridgeport, Conn., is the general contractor on this project.



WORKING A FEW INCHES FROM THE EDGE of the grade drop-off and 13 feet 6 inches from the pavement, a Gar Wood-Buckeye Model 306 ditcher digs a trench for lighting cable at an Ohio Turnpike interchange. Special off-set digging-wheel frames permit trenching to be done in line with the outside edge of either crawler.



IT'S A
Bullclam

with famous Drott Bullclam Shovel efficiency on all Sanitary Landfill operations—*plus* unequalled ability to *strip, grade, and spread*, using clam lip control. And as a Bullclam, the Four-In-One can *self-load* like a carry-type scraper!

TD-14 FOUR-IN-ONE

for one moderate investment!



IT'S A
Bulldozer

with clam open in bulldozing position, the big-capacity earth-rolling blade has cutting edge and shoes on the ground. You regulate depth of cut with ease and accuracy by hydraulic "radius control" of blade pitch (forward and backward).



International Harvester Company, Chicago 1, Illinois

INTERNATIONAL®
DROTT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 313

Lincoln Foundation offers welding-process awards

The James F. Lincoln Arc Welding Foundation, Cleveland, Ohio, is offering cash awards amounting to \$20,000 for suggestions that will foster the progress of arc welding. The top individual award is \$5,000.

Residents of the United States or its possessions may submit ideas, and no restrictions have been placed on either the nature or extent of entries.

All entries must be made by July 30, 1956. Complete information and rules may be obtained from the foundation.

Copco Pacific names head of compressor sales group

Lincoln M. Knight has been appointed head of the recently formed compressor sales division of Copco Pacific, Ltd., San Carlos, Calif. The new division will provide the mining and construction industries in the West with Atlas portable and stationary compressors and Swedish-made rock drills.

Davis T. Spence will serve as sales engineer with the new division.

Marlow Pumps names field representative

Richard G. Bolling is now covering the Virginia-North Carolina area as district engineer for the Marlow Pumps Division of Bell & Gossett Co., Midland Park, N. J. He will make his headquarters at 2814 Dellwood Drive, Greensboro, N. C.

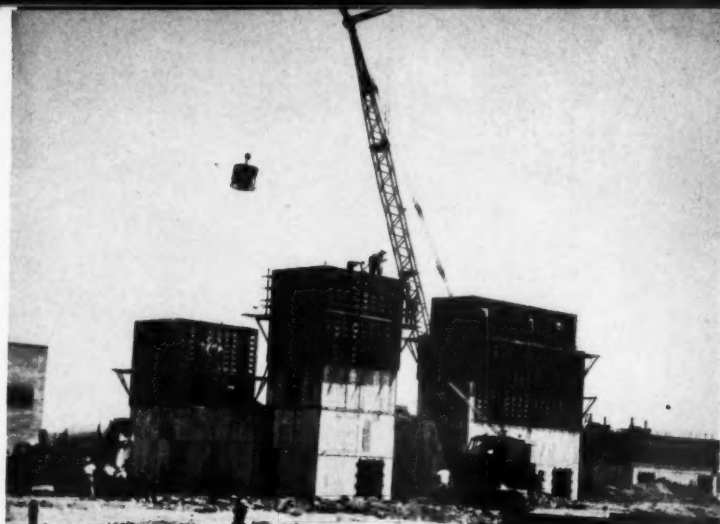
B-L-H appoints three

Thomas J. Hunter has been appointed manager of the combined industrial and public relations departments of the Baldwin-Lima-Hamilton Corp., Lima, Ohio.

He will be assisted by Ray R. Runser as supervisor of labor relations, and Frank Bruton, who will fill a labor-relations post at Eddystone, Pa.

Pence-Joost Merger

To handle the manufacture and distribution of Agricat tractors, parts, and attachments, Earl H. Pence and Joost Mfg. Co., both of Berkeley, Calif., merged, effective December 15, 1955.



UNIQUE IN DESIGN are the five aircraft-engine test cells being built at Trans World Airlines' overhaul base at Mid-Continent International Airport, Kansas City, Mo. Unique also is the method of stripping the Symons forms: panels are removed by a workman seated in a bosun's chair suspended from the crane boom.



THE NEXT-TO-THE-LAST STEP in concrete paving at Hector Field, Fargo, N. Dak., is done by a workman using an air jet supplied by a Le Roi Tractair to clean pavement joints. Northern Improvement Co., Fargo, uses asphalt joint filler to complete the 3,000-foot runway extension.

MANITOWOC faster cycle speed moves more dirt



Leveling ground at a Staten Island borrow pit recently, contractor Peter Juzefyk, Elizabeth, N. J. excavated approximately 100,000 yards of gravel fill to complete the job. Juzefyk averaged 2 minutes - 50 seconds time to load

16-yd. haul units with his Manitowoc Model 2000 1 1/4-yd. shovel. Total loading time often included a move to place the shovel in a better digging position! As much as 2100 yards was removed from the site in one 9 hour shift.

Why MANITOWOC 2000 does a faster job

FULL USE OF POWER speeds digging. Only 13 gears and pinions make more power available at all times to add horsepower at the dipper (only working gears turn). SMOOTH, DISC-TYPE CLUTCHES speed operation - make control extremely precise. As easily adjustable as automobile-type clutches. SIMPLICITY OF DESIGN and smooth operation greatly add to cycle speed. Sliding pinion arrange-

ment uses just one set of clutches to travel, swing and boom hoist. FAST TRAVEL with extra push for grades up to 30%. Positive steering utilizes either crawler, forward or back. Rugged, simple crawler base has balanced stability needed for digging on uneven terrain. EASILY CONVERTIBLE in the field to crane, dragline and trench hoe operation - whatever front end the job demands.

MANITOWOC

SHOVELS
1-5 1/2 YD.

Special Line

CRANES
20-100 TON

On your next bid let Manitowoc speed and power help cinch the deal. Contact your helpful Manitowoc distributor for the full, profitable story.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 314

New text covers geometry and engineering drawing

All the material needed for a course in engineering drawing and descriptive geometry is included on a single volume in "Engineering Drawing and Geometry," by Randolph P. Hoelscher and Clifford H. Springer.

The text combines traditional and modern approaches to teaching these subjects and aims at producing engineers rather than draftsmen. While building fundamental skills, the book also stresses the development of clear thinking and good judgment, and emphasizes the importance of drafting as an essential tool of engineering. An understanding of basic principles, rather than the mere acquisition of manual skills is the objective of the text.

Up-to-date information on design for interchangeable assembly covers limit dimensioning, geometrical and positional tolerancing. Axonometric, standard isometric, and oblique projection are also covered.

**POUR CONCRETE
at LOWER COST**

**BUY EFCO
STEEL FORMS**

Lifetime steel faces
never need replacing

Easy to handle and assemble

Save time, material, money

Low original cost

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on a rental basis

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Washington, D. C. • Decatur, Ga. • Dallas, Texas • Los
Angeles, Calif. • Oakland, Calif. • Denver, Colo.

For more facts, circle No. 315

CONTRACTORS AND ENGINEERS



OVER 320,000 YARDS OF EARTH AND ROCK are being moved by International TD-24 tractors in building a 3.2-mile training road with a grade of 10 to 13 per cent at Camp Pendleton, Calif.



BEFORE DITCH DIGGING STARTS, a Caterpillar D8 and ripper loosen material on a stretch of the Pacific Northwest Pipeline, a \$163 million, 1,400-mile natural-gas line between the states of New Mexico and Oregon.



COLUMNS for the Ground Electronics project at Griffiss AFB, Rome, N. Y., are poured by a Lima crane with an Insley bucket. Transit-mix concrete is delivered in Rex mixers.

Twenty-eight chapters include discussions of such topics as lettering, the use and care of instruments, sketching, shop terms and processes, the geometry of engineering drawing, intersections and developments, architectural, structural, and pipe drawing, and a study of map drawing. An appendix is also included.

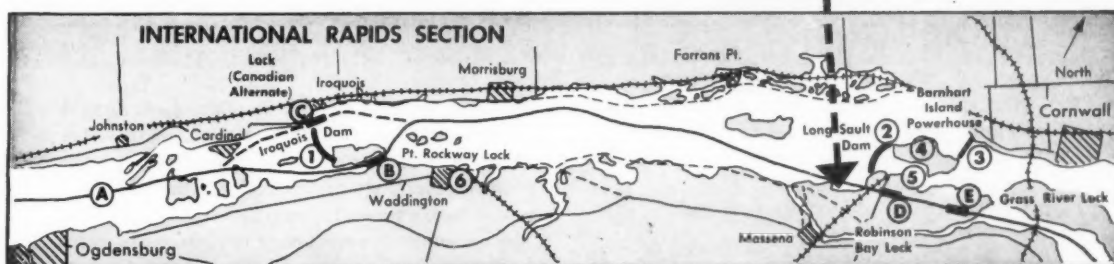
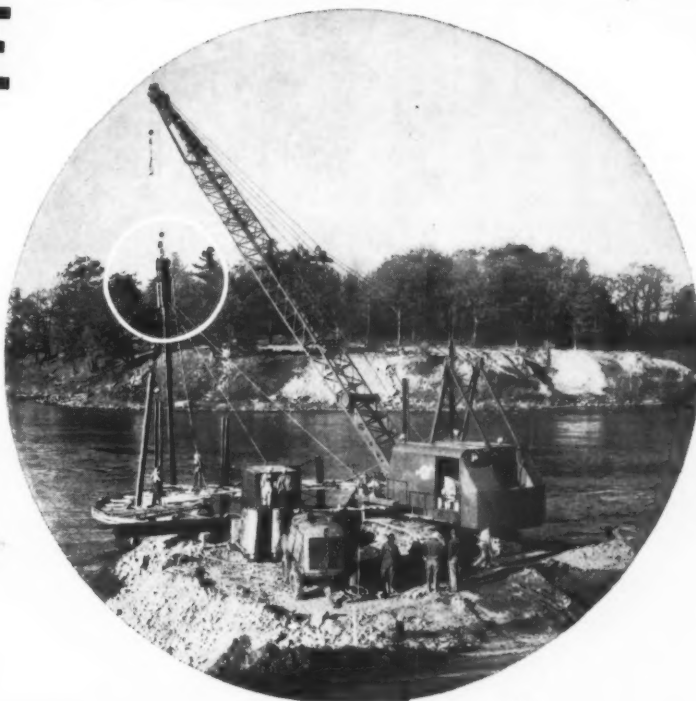
Photographs, diagrams, and cross-section views illustrate the text. Conversion and trigonometric tables are also included. A complete six-page index simplifies reference.

Workbooks to be used with the text emphasize the application of theory to practical problems. They will be published annually until there are at least four different collections for each course.

Priced at \$8, "Engineering Drawing and Geometry" is available from the publisher, John Wiley & Sons, Inc., 440 Fourth Ave., New York, N. Y. The accompanying workbooks may be obtained from the Stipes Publishing Co., 17 Taylor St., Champaign, Ill.

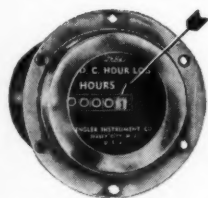
ST. LAWRENCE POWER PROJECT

started with blows by a
McKIERNAN-TERRY
Pile Hammer



LOOK!
No Hands

ENGLER Direct-reading



**D. C.
HOUR
LOG**

Indicates hours and minutes of operation of powered equipment. Provides maintenance records and assures maximum utilization of equipment.

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**MATERIAL HANDLING EQUIPMENT
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GENERATORS • CRANES • GRADERS**

Installed as original equipment or recommended by leading manufacturers.

Send for Bulletin L-754

ENGLER INSTRUMENT CO.
255 Culver Ave. Jersey City, N. J.

For more facts, circle No. 316

FEBRUARY, 1956

By 1959, the St. Lawrence River, between Ogdensburg and Massena, N. Y., will be delivering more than 12½ billion kilowatt-hours of electric energy per year by means of hydro-electric plants served by 3 dams.

The first major contract for this huge undertaking was started by Dravo Corporation at the foot of Long Sault Island near Massena late in 1954. As the first step in diverting the south channel of the river to permit building one of the dams, a McKiernan-Terry 9B3 Double-Acting Hammer was used to set the initial piling for a cofferdam.

Here, as in many thousands of large and small projects all over the world—wherever stabilization is required for foundations—the contractor selected McKiernan-Terry Pile Hammers to speed the work and help assure a creditable, profitable job.

McKIERNAN-TERRY CORPORATION
82 Richards Avenue, Dover, New Jersey

Manufacturing Engineers Plants: Harrison, N. J., Dover, N. J.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 317



**McKIERNAN
TERRY**

Also Manufacturers of Coal and
Ore Unloaders and Bridges,
Grab Buckets, and Special Machinery

ME-364

113

manufacturer memos

New Seaman-Gunnison Corp. appoints D. J. Seaman, Jr.

The former chief engineer of Seaman Motors, Inc., Donald J. Seaman, Jr., has joined the newly organized Seaman-Gunnison Corp., Baraboo, Wis., to handle engineering and new equipment development for the firm.

Seaman, who has done field work in this country and in Latin America in the development and operation of soil stabilization and highway maintenance equipment, also has broad ex-

perience in all phases of road-building equipment manufacture.

The new firm, successor to Gunnison Mfg. Co., will build the estab-

New equipment development and engineering for Seaman-Gunnison Corp. has been placed in the hands of Donald J. Seaman, Jr.



lished line of asphalt distributors, street flushers, and high-pressure pumping units formerly made by Gunnison. Ivor E. Gunnison, founder and sole owner of the Gunnison organization, will serve as president and general manager of the new company,

which plans the development of new road-building equipment as well as the manufacture of the Gunnison line.

Hyster president elected vice president of NAM

Ernest G. Swigert, president of the Hyster Co., Portland, Oreg., has been elected national vice president of the National Association of Manufacturers. He has served on the board of directors of the NAM for a number of years, and during the past year was regional vice president.

Founder of the Hyster Co., manufacturer of tractor-mounted job equipment, Swigert is the first industrialist from the Northwest to hold such a high post in the 20,000-member organization.

Blaw-Knox appoints new division heads

The Blaw-Knox Co., Pittsburgh, Pa., has made seven interim appointments within the recently acquired division, Continental Foundry & Machine. Heading the list as vice president is David Lyle. He will also serve in the same capacity with Lewis Machinery Division. A. E. Murton has been named vice president of roll sales for both Continental and Blaw-Knox Rolls divisions. Serving as vice president of roll metallurgical research for these same two divisions is Dr. F. H. Allison, Jr. Headquarters for these three officers will be in Pittsburgh.

B. P. Hammond has been named vice president of Eastern casting sales, and H. A. Forsberg is vice president of Western casting sales. Controller of the division is Arthur Kulper. M. G. Sternberg was also named a vice president.

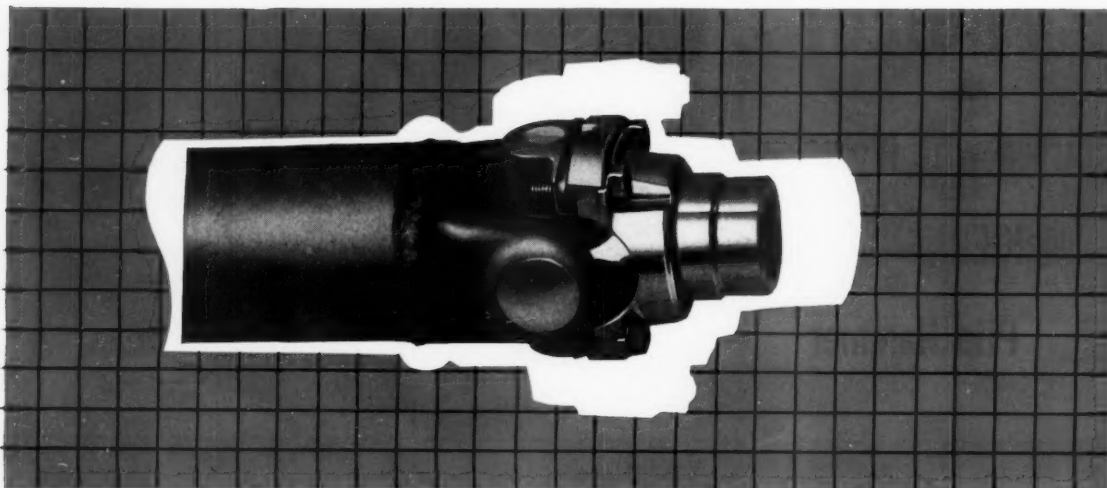
Copes-Vulcan, formerly a division of Continental at Erie, Pa., will be headed by G. L. Davis, vice president. Other newly appointed officers of this division are: William L. Hunter, vice president and general manager; D. E. Hibner, Jr., vice president in charge of sales; C. E. Smith, vice president in charge of manufacturing, and J. N. Harris, controller.

B-L-H sales appointment

The Construction Equipment Division of Baldwin-Lima-Hamilton Corp., Lima, Ohio, has appointed J. V. Gunter district sales manager for Lima shovels, cranes, and draglines in the Southern district.

From headquarters in Atlanta, Ga., Mr. Gunter will cover the states of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North and South Carolina, and Tennessee, and will also cover parts of Missouri, Oklahoma, and Virginia.

FOUR WAYS BETTER



1. **STRONGER**—2500 lbs. Ft. static torque. This NEW joint is stronger than any previous automobile joint of comparable size.

2. **SMALLER**—3-9/16" swing diameter. This NEW joint requires less clearance, making possible more compact design.

3. **LIGHTER**—This NEW joint weighs 20% less than previous joints having the same torque capacity.

4. **EASIER TO INSTALL**—This NEW joint saves time and money on the assembly line because it has less parts to handle.

Give your next car the benefit of the 4 advantages provided by this NEW joint development. Let MECHANICS engineers help you design power transmission lines better suited to the low floor board, more powerful engine and higher speed requirements of your future models. Send print and specifications—for their prompt recommendations.

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Roller Bearing

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Shackle Chain HOOKS

Use on "HIGH TEST" Chain
EXTRA STRONG

Even the pin is made of hi-strength steel and heat-treated.

SAVES TIME
Can be attached anywhere on the job. Only a pair of pliers needed.

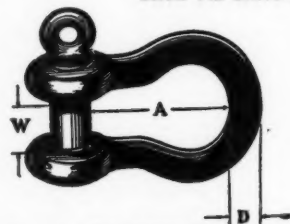
GRAB HOOKS

Available for Chain Sizes 1/4" 5/16", 3/8" 7/16", 1/2" 5/8"

SLIP HOOKS

Available for Chain Sizes 1/4" 5/16", 3/8" and 1/2"

ANCHOR and CHAIN Screw Pin SHACKLES



Forged of HI-STRENGTH STEEL
Available in sizes 1/4" to 2". **EXTRA STRONG**
—EXTRA TOUGH. Self-colored or galvanized
Order from your Distributor or Write

MIDLAND INDUSTRIES, INC.
Cedar Rapids, Iowa

For more facts, circle No. 319

CONTRACTORS AND ENGINEERS

William F. Briney, the new manager of construction machinery sales for the Le Roi Division of Westinghouse Air Brake Co.



Le Roi promotes two

The new manager of construction machinery sales for the Le Roi Division of Westinghouse Air Brake Co., Milwaukee, Wis., is William F. Briney. A member of the Le Roi organization since 1949, Mr. Briney will be responsible for the sales of portable air compressors, Tractairs, rock drills, and other products used by the construction industry. He will also recommend the development of new products and the modification of existing units.

Paul Azzolina has been named manager of the service department for the firm. Formerly the assistant manager of the department, he will supervise field servicing of all Le Roi products, maintain the parts department, and publish service bulletins and parts catalogs.

Universal Atlas changes

Two promotions have been made in the engineering department of the Universal Atlas Cement Co., New York, N. Y., a subsidiary of the United States Steel Corp. Chester D. Rugen has been appointed assistant vice president in charge of engineering, and Robert B. Jordan has been appointed chief engineer.

Raymond L. Walsh, former assistant vice president and chief engineer, has retired from active service but is being retained by the firm as a consultant.

Armco division promotes

Two promotions have been made by the North Pacific Division of Armco Drainage & Metal Products, Inc., Middletown, Ohio, a subsidiary of the Armco Steel Corp.

D. J. Stoker has been made division manager, succeeding E. W. Gibson who is retiring. Stoker will be replaced as division sales manager by Marvyn R. Ambuhl, former division sales engineer.

Both men will make their headquarters in the division office in Portland, Oreg.

Goodyear names salesmen

Two new members have been added to the expanding sales staff of the Goodyear Tire & Rubber Co., Akron, Ohio.

Ormond R. Gillen has been appointed sales service staffman and will provide technical service to Goodyear customers.

Joining the organization as a sales trainee is F. Joseph Triggs, a Rutgers University graduate.

Both men will work with the company's chemical division, with which Gillen had been associated before a two-year period of service with the army. They will sell rubber-reinforcing resins.

For more facts, circle No. 320—

FEBRUARY, 1956

CCS and Wooldridge Mfg. appoint three executives

Three top-level appointments within the Wooldridge Mfg. Division have been made by Continental Copper & Steel Industries, Inc., New York, N. Y. Henry Gusman, who has headed the Wooldridge organization in Sunnyvale Calif., for 19 years, has been appointed a member of the CCS management committee. He will make his headquarters in New York.

The former assistant general manager, J. D. Gusman, has been named general manager of the Wooldridge firm and an assistant vice president



J. D. Gusman, assistant vice president of Continental Copper & Steel Industries, Inc., and general manager of its Wooldridge Mfg. Division.

E. E. Esgate, the new general sales manager of the Wooldridge Mfg. Division of Continental Copper & Steel Industries, Inc.



of CCS. E. E. Esgate will serve as general sales manager for the Wooldridge division.

District sales manager is appointed by Stow

Covering the states of Texas, New Mexico, Oklahoma, Arkansas, Louisiana, and Mississippi as district sales manager for the Stow Mfg. Co., Binghamton, N. Y., is Lloyd Laney. He will handle sales of concrete vibrators, vibrating screeds, concrete grinders, and the Stow Roto-Trowel from his office at 2148 Lexington St., Houston, Texas.

“Not How Big?” But “How Good?”

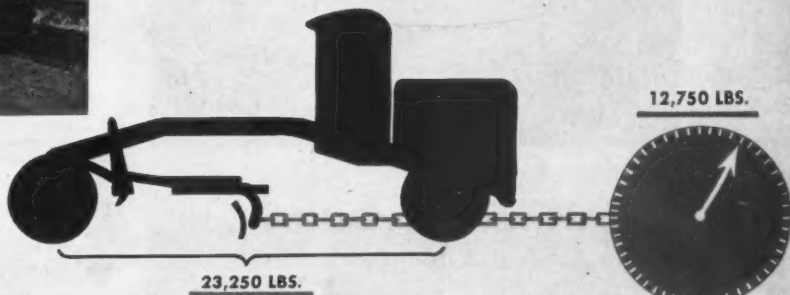


The ability of any motor grader to do hard cutting, and move big blade loads of material in the lower gears, where heavy work is done, depends entirely upon the amount of weight carried on *driving wheels*. Total weight has nothing to do with it.

Most for Your Money

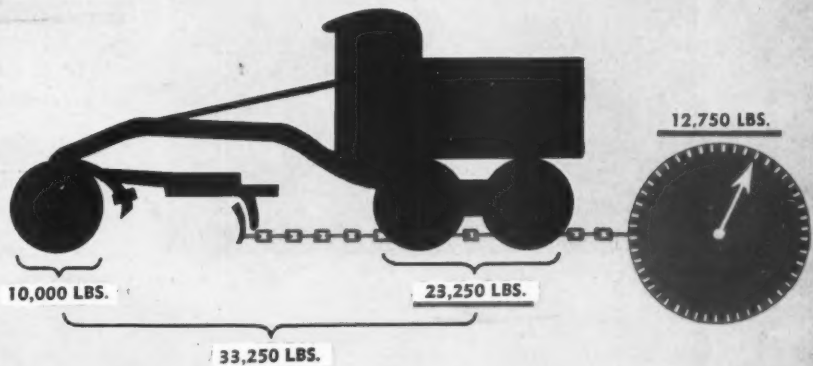
From every standpoint . . . first cost, operating cost and upkeep . . . the A-W Power Grader gives you more for your money . . . moves 30 percent more material than an ordinary grader of equal weight and horsepower; and as much material as heavier, more expensive graders . . . as explained in the diagrams at the right.

SIZE IS NOT THE MEASURE OF MOTOR GRADER PERFORMANCE



ABOVE: This Austin-Western Power Grader weighs 23,250 lbs.—all carried on driving wheels. Working in average dirt, it has a blade pull of 12,750 lbs.

BELOW: To obtain the same blade pull, an ordinary motor grader would have to carry 23,250 lbs. on its rear drivers; PLUS about 10,000 lbs. on its dead front end, for a total of 33,250 lbs.



There's more to the story. All-Wheel Steer . . . another exclusive Austin-Western feature . . . makes the machine twice as maneuverable as graders with front steer only; while the Controlled Traction made possible by the teamwork of All-Wheel Drive and All-Wheel Steer moves more material . . . moves it farther . . . moves it faster. Your nearby Austin-Western distributor will be glad to tell you the whole story of "The Power Graders That Have Everything."

Austin-Western
Power Graders • Motor Sweepers
Road Rollers • Hydraulic Cranes



Manufactured by

AUSTIN-WESTERN WORKS
CONSTRUCTION EQUIPMENT DIVISION
Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS

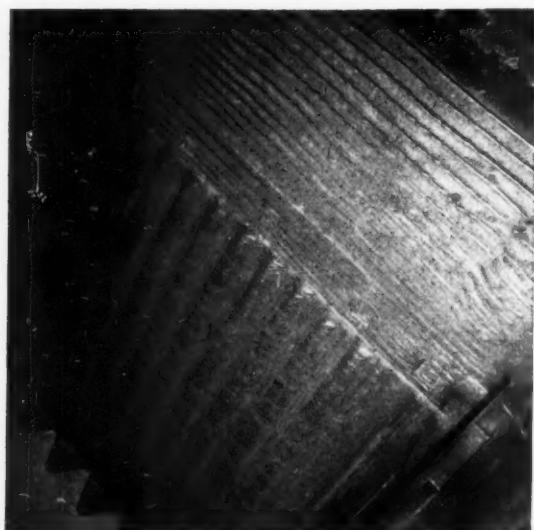
Construction Equipment Division



TRACTOR SHOVELS: New Speedall models feature speedmatic power-shift transmission, extra-rugged construction for competing with heavy crawler equipment. Capacities: 1¼, 1¾, 2½ cubic yards struck. Gasoline or diesel engine; custom attachments. For details circle No. 71 on card at page 18, or write to Pettibone Muliken Corp., 4720 W. Division St., Chicago 51, Ill.



HOPPER DUMP TRAILERS: Fruehauf hopper dumps feature high-strength design, light weight, 14-ton payload capacity. Used in hauling and spreading aggregate for base materials, other operations. Relatively small trailer pulls unit. For details circle No. 79 on card at page 18, or write to Fruehauf Trailer Co., 10928 Harper Ave., Detroit 32, Mich.



how to **EXTEND** working life of jaw crushers

apply **VICTOR**
HARDFACING



No Disassembly This jaw crusher was hardfaced with jaws bolted in place, using 3/16" coated Tube Victorite. Despite cramped working area only 12" deep and 36" wide, high deposition rate and low spatter loss enabled welder to get uniform, non-sagging, long-wearing bead without distorting jaw.

Downtime Saver Because it goes on fast, without flux interference, and sets up quickly, coated Tube Victorite is wonderful for hardfacing on the job without disassembly of equipment.

Where To Use Coated Tube Victorite is a high alloy content rod with Rockwell C hardness of 55-58. It was developed specifically for tools subject to severe abrasion and impact, such as:

Ripper Teeth	Tool Joints
Pug Mill Augers	Scraper Blades
Jaw Crushers	Asphalt Mixer
Roll Crushers	Paddle Shanks
Die Rings	Mill Hammers
	Bucket Lips

It welds easily to carbon alloy and manganese steels—the latter frequently is used for buildup before applying coated Tube Victorite. It can be used for position welding. Deposit is smooth, even, free of pin holes. Made for AC and DC (reverse polarity) application.

Profitable
dealerships open;
inquire now!

VICTOR

for hardfacing

VICTOR EQUIPMENT COMPANY
ALLOY ROD & METAL DIVISION

Los Angeles 59, California • Wakita, Oklahoma

For more facts, use Reader-Reply Card opposite page 18 and circle No. 321

Waterproof papers

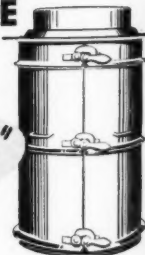
■ Glass-reinforced waterproof building papers—Silver-Champ, Scuf-Champ, and Copper-Champ—are described in a bulletin from Stocker Mfg. Co., Netcong, N. J. Details are given on Scuf-Champ, for concrete curing, concrete slab construction, and backing up stone faces; Silver-Champ, for building insulation; and Copper-Champ, for foundation damp coursing, membrane waterproofing, and corner flashing. Diagrams illustrate each use of these papers.

To obtain this bulletin write to the company, or use the Request Card at page 18. Circle No. 49.

Trenchers, backfillers

■ A complete line of trenchers and backfillers for a wide variety of applications ranging from small trench jobs to huge cross-country pipeline jobs is described in a bulletin from The Cleveland Trencher Co. The ca-

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For **QUALITY**
CONCRETE
PIPE
FORMS
"STANDARD"
The World Over



Backed by over 45 years of reliable service, the QUINN Heavy Duty form is recognized as the STANDARD design and the finest concrete pipe form everywhere. Used in making pipe by vibration, spading or tamping. Sizes for pipe from 10" to 120" and larger. Tongue and groove (as shown) or bell end pipe in any length desired. If your pipe orders specify extra large sizes, odd shapes or unusual lengths, there's a Quinn form made to produce the finest pipe at lowest possible cost.

Also Manufacturers of
QUINN CONCRETE PIPE MACHINES



Free CATALOG

Illustrates our complete line of equipment. Contains pages of valuable tips for the concrete pipe manufacturer. Write today for your free copy and estimates.

Quinn WIRE & IRON WORKS
BOONE, IOWA

For more facts, circle No. 322
CONTRACTORS AND ENGINEERS



GRADER ATTACHMENTS: New hydraulic attachments for Caterpillar No. 12 and 112 motor graders include shiftable moldboard, snow plow and bulldozer mounting, and snow wing. All are redesigned, stronger. New enclosed hydraulic system; controls conveniently located in cab. For details circle No. 70 on card at page 18, or write to **Caterpillar Tractor Co., Peoria, Ill.**



TRUCK MIXER: Champion Model CS-65 has rated capacity of $6\frac{1}{2}$ cubic yards, but is said to handle much more. Eight-yard agitator, 310-cubic-foot drum, 120-gallon water tank, Chrysler 230-cubic-inch engine. Fast, steady discharge; easy inspection. For details circle No. 68 on card at page 18, or write to **Whiteman Mfg. Co., 3249 Casitas Ave., Los Angeles 39, Calif.**

capacities, specifications, and dimensions of six trencher models and two backfiller models are given. There are 27 action shots of the equipment.

To obtain these sheets write to The Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 44.

Concrete-pipe lining

A catalog from Amercoat Corp. gives the function, and general, physical, and chemical properties of T-Lock Amer-Plate lining for concrete pipe and structures. Action shots and a brief resume of installing lining for precast pipe, cast-in-place monolithic pipe, and structures are included.

To obtain this catalog write to Amercoat Corp., 4809 Firestone Blvd., South Gate, Calif., or use the Request Card that is bound in at page 18. Circle No. 11.

PLACING CONCRETE SETTING STRUCTURAL STEEL HANDLING MATERIALS

These Bucyrus-Erie Crane Features Help You On Every Phase of Building

Maximum Stability- A low center of gravity and long, wide-spread crawler units give Bucyrus-Erie cranes a firm footing for the safe handling of long booms. This kind of stability enables operators to work rapidly.

"Full-Feel" Control- Direct-connected controls give operator unequaled "feel" of the load. Big clutches are instantly responsive, smooth in action, provide utmost load-handling safety, let the operator "inch" load accurately up or down.

Independent Boom Hoist- Boom hoist on Bucyrus-Erie cranes is independent of all other functions . . . is available instantly for boom angle changes. Lowering speed is power-controlled.

Simple Jib Extension Connections- Jib extensions can be connected without removing sheaves, guards, suspension ropes or any of the boom-point machinery.

See your Bucyrus-Erie distributor for complete information on cranes with boom lengths up to 120 feet. Jib extensions are from 10' to 30' long. Crane capacities are variable depending on length of boom, size of crawler mounting, and counterweight used.

153E55

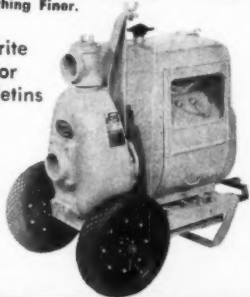
RICE

The REALLY COMPLETE
CONTRACTORS' LINE
CENTRIFUGAL & DIAPHRAGM
PUMPS

CENTRIFUGALS—All AGC Sizes 1½" thru 10". Complete Line Light-weights. All Power Options.

DIAPHRAGMS—2", 3" and 4" and the Big Double 4". Coming Soon a Super-line of Straight Centrifugals. Nothing Finer.

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Bulletins



RICE PUMP & MACHINE CO.
220 PARK AVE. BELGIUM, WIS.

For more facts, circle No. 323

FEBRUARY, 1956

**BUCYRUS
ERIE**

South Milwaukee
Wisconsin

75
YEARS OF SERVICE
to Men Who
Shape the Earth

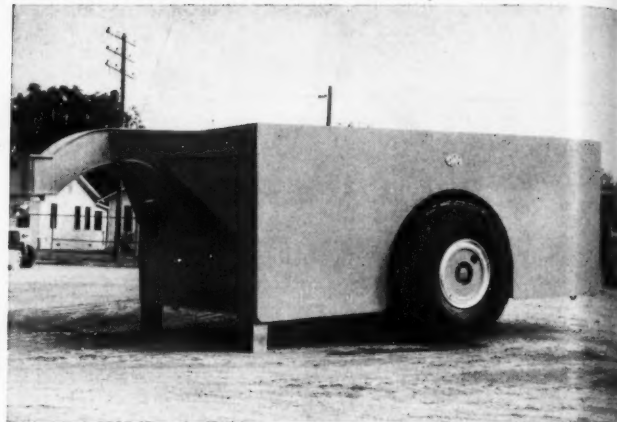
A Bucyrus-Erie 54-B with 100-ft. boom and 20-ft. jib pours concrete for an \$11 million hospital project for County of Milwaukee, Wisconsin.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 324



REAR-DUMP TRAILER: The new Athey PR-15 for use with the Cat DW15 tractor. Capacity of 15.6 cubic yards, speeds up to 31.3 mph, right or left angle turns of 90 degrees. Three-stage hydraulic hoists tilt the body 60 degrees for quick, position ejection. For details circle No. 76 on card at page 18, or write to **Athey Products Corp.**, 5631 W. 65th St., Chicago 38, Ill.



PNEUMATIC COMPACTOR: Tamco Model 50 (for crawler tractors) and Model 56 (for rubber-tire prime movers) features 20-foot length, rolling width of 9 feet 8 inches, full-width push block, gooseneck tongue, choice of 90 or 150-pound tires. Both rated at 50 tons. For details circle No. 72 on card at page 18, or write to the **Tamco Mfg. Co.**, San Antonio, Texas.

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THE AMERICAN LINE

High Explosives	Electric Blasting Caps
Permissibles	Instantaneous
Blasting Powder	Regular Delay
Blasting Caps	Split-second Delay
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If it's AMERICAN, it's dependable!

Sales Offices: New York City, Latrobe, Pa., Pottsville, Pa.,
Scranton, Pa., St. Louis, Mo., Bluefield, W. Va.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 325

Crawler tractors

■ Engineering, design, and performance features of the HD-6 and HD-21 diesel-powered crawler tractors are described in two catalogs from the Allis-Chalmers Mfg. Co., Milwaukee, Wis. Photographs and illustrations give technical and operating data on these models. Complete specifications and the full line of matched equipment and accessories are listed.

To obtain Catalog MS-461 on the HD-6 and Catalog MS-457 on the Model HD-21 write to the company, or use the Request Card at page 18. Circle No. 5.

Three protective clothing firms effect merger

Three of the country's oldest manufacturers of protective clothing, the H. M. Sawyer & Son Co., Cambridge, Mass.; the J. F. Carter Co., Beverly, Mass.; and the A. J. Tower Co., Boston, Mass., have merged in a new or-

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CAISSONS SHAFTS DRILLED AND UNDERREAMED PIERS

SPECIAL DRILLING PROBLEMS

Wire or phone for a quotation
on your next foundation job—

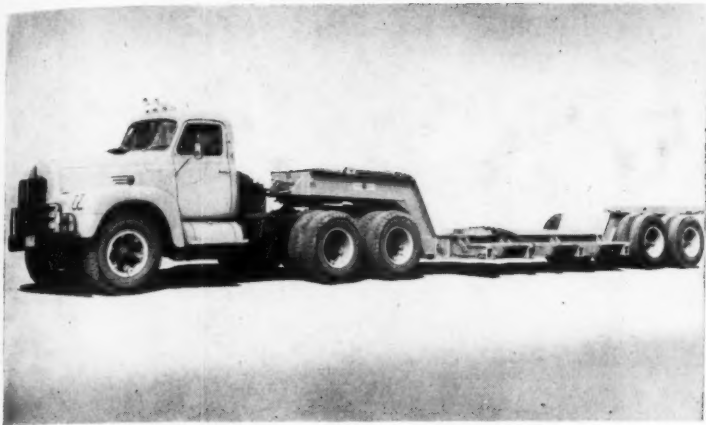
Offices in
PITTSBURGH, PA.;
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McKINNEY
DRILLING COMPANY

NACOGDOCHES, TEXAS
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For more facts, circle No. 326

CONTRACTORS AND ENGINEERS



TRAILER LINE: Model GPR removable-gooseneck trailers are available in standard models ranging from 15 through 60 tons capacity; specially engineered units to 100 tons capacity. Flat or drop platforms; tandem, triple, or trunnion axle assemblies. For details circle No. 77 on card at page 18, or write to Transport Trailers, Inc., P. O. Box 968, Cedar Rapids, Iowa.



MOTOR GRADER: New Speed Grader is reported to have so much reserve power that full moldboard loads can be swung 360 degrees without stalling or jamming of the circle controls. Said to have the heaviest frame of any grader on the market. For details circle No. 74 on card at page 18, or write to Pettibone New York Corp., Dept. 20, Rome, N. Y.

ganization to be known as Sawyer-Tower, Inc. The merger will increase efficiency in research, development, production, marketing, and distribution. Each company will operate as an independent division of the parent organization.

Charles L. Foote, president of the Sawyer firm, will serve as president of the new organization, which will be located in Cambridge.

Welded steel pipe

■ A new bulletin from Armco Drainage & Metal Products, Inc., Middletown, Ohio, describes and illustrates the advantages of welded steel pipe for foundation piling, factory, water supply, sewage disposal, and other piping uses.

Dimensions, properties, and other data are given along with a list of eleven advantages.

To obtain Bulletin WSP-11055 write to the company, or use the Request Card at page 18. Circle No. 120.

SPRAY STARTING FLUID with ATOMIZER

1. Application:
 - A. ATOM-IZIT—portable unit; external, thru intake manifold.
 - B. Priming line to intake manifold.
2. Never, never pour a more potent fuel into an engine than fuel intended to be used by engine manufacturer. Our handy Atomizer conserves quantity, provides more safety, for operators, and fits original cans.
3. ATOM-IZIT and always, always let the Diesel or gasoline engine tell you how much starting fluid it needs to start and warm up.
4. Field test with our simple, economical and practical Spray Starting Fluid and portable Atomizer.



Caterpillar Model D318 Diesel Used in No. 12 Grader

Sold thru wholesalers. Write for FREE folder.

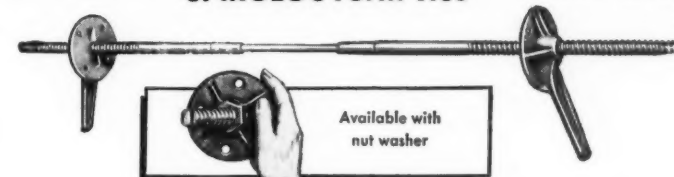
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STARTING FLUID COMPANY

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a Complete Line From 1 Source

SPIROLOC Form Ties

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Available with nut washer

SPIROLOC Cone Nut Assembly



The most positive internal spreader and form tie

- Greater tie strength for heavy construction
- Fewer ties per sq. ft. of form area. LOWER MATERIAL and LABOR COSTS
- Positive breakbacks
- Permanent, reusable equipment
- RENTED . . . SOLD

TWISTYES

Positive Spreader Ties for all types of Concrete Construction



Combination wedge and bearing plate . . . easy application . . . won't twist or fall off—ample take-up.



- Low cost ties for job-built or prefabricated forms
- Used with or without walers
- Accurate breakback . . . minimum plug required
- Choice of Spreader Washer . . . 7/8" flat is standard
- Rugged Twistye and Snap Tie Clamps have extra bearing surface . . . additional safety factor

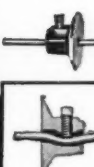
SNAP TIES



Curved ends speed installation and stripping . . . long slope wedge for ample take-up. Extra nail holes permit nailing clamp in any position.

FORM CLAMPS

The Most Versatile Tie . . . At the Lowest Cost



"Sure-Grip" principle means positive locking SAFE . . . SURE Tying

- 2 Form clamps and a mild steel rod make a tie to handle any condition
- Wide clamp base gives more bearing on waler . . . won't "bite" at maximum loads
- Notched base permits nailing to waler

UNIVERSAL FORM CLAMP CO.

GENERAL OFFICES AND FACTORY: 1238 N. KOSTNER • CHICAGO 31, ILLINOIS

OFFICES AND WAREHOUSES:
CLEVELAND, OHIO, 24901 Lakeland Blvd. • BALTIMORE, MD., 1020 N. Kresson St.
HOUSTON, TEXAS, 2314 Preston Ave. • SAN LEANDRO, CALIF., 2051-9 Williams St.
LOS ANGELES, CALIF., 5855 South Western Ave. • ATLANTA, GA., 1401 Howell Mill Rd.
DISTRIBUTORS IN PRINCIPAL CITIES

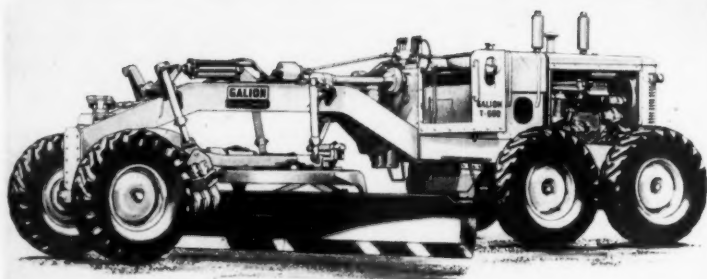
Service
Wherever



You Build . . . Coast to Coast

Copyright 1955 by UNIVERSAL FORM CLAMP CO., Chicago 31, Ill.

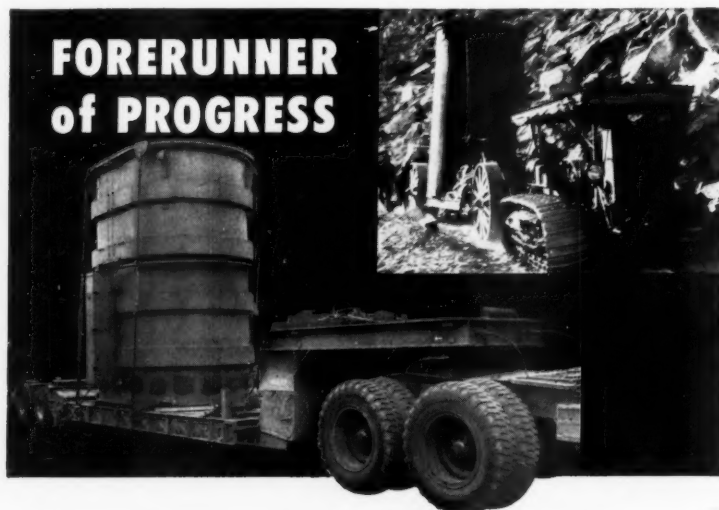
For more facts, use Reader-Reply Card opposite page 18 and circle No. 328



MOTOR GRADER: The new Galion T-600 is a 140-hp machine equipped with Grade-O-Matic drive, which utilizes torque converter and power-shift transmission. Four speeds forward, four reverse. Thirteen-foot hydraulic shifttable moldboard; 14:00 x 24 tires front and rear. For details circle No. 78 on card at page 18, or write to the Galion Iron Works & Mfg. Co., Galion, Ohio.



COMPACTOR: Neither a sheepsfoot nor a smooth roller, Hyster's Grid roller can exert compacting pressure of up to 30,000 pounds when fully ballasted. High densities at high speeds. Does not displace material. For embankment compaction, rock crushing, etc. For details circle No. 73 on card at page 18, or write to the Hyster Co., Box 4318, Portland, Ore.



FORERUNNER of PROGRESS

Contrast this early model Rogers Trailer hauling a 6 ton transformer over mountainous roads with a present day model equipped with the remarkable quick, detachable gooseneck.

The contrast graphically illustrates the vast improvements that have been made in the large and diversified line of

ROGERS TRAILERS

Operators of low bed trailers will do well to thoroughly investigate Rogers Trailers and make comparisons with others as to design, construction and operating features.

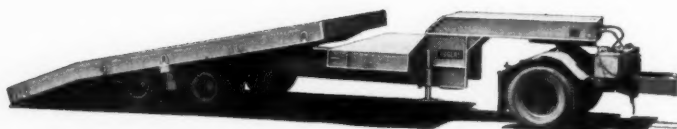
There are general purpose trailers for handling many types of loads. Others are especially suited for moving caterpillar mounted cranes. Another trails along behind a dump truck, doubling its usefulness. Tilt deck trailers handle certain jobs especially well, and pole trailers aid the conventional trailers in handling long loads, such as stacks, tanks, processing equipment.



We frankly believe that if you "Check You'll Choose A Rogers." Write for the new catalog.

ROGERS BROS. CORP. ALBION PENNA.

Export Office: 50 Church St., New York 7, N. Y., U. S. A. — Cable Address: Brosites



Divided bed, tilt deck trailer with goose neck

Lift trucks

■ A folder from A. Cresci & Son, Inc., details the Hi-Lift line of liftbody trucks for hauling, loading, and occasional maintenance jobs. Applications of the end-dump unit and other models used in hauling and loading aggregate and building materials, among other jobs, are illustrated. Outstanding features, optional equipment, and complete specifications are listed.

To obtain this folder write to A. Cresci & Son, Inc., Boulevard and Grape Streets, Vineland, N. J., or use the Request Card at page 18. Circle No. 28.

W-S name change

The Watson-Stillman Fittings Division of H. K. Porter Co., Roselle, N. J., has changed its name to the W-S Fittings Division. The division, acquired by Porter in 1952, manufactures forged steel fittings.

The division's trade-mark, two diamonds separated by the letters W-S, will be used to identify all products made after the change.

RUNNING SAND TO

SOLID SOIL

IN MINUTES
WITH



Water seeping through walls?
Excavating through running sand?

By injecting chemicals into the soil behind tunnel or basement walls, the soil can be rendered impervious and leakage stopped.

By injecting chemicals into sand in advance of excavation, tunneling and caisson digging operations can be simplified and progress improved.

Chemject engineers and chemists are available for consultation to discuss your job.

* Trade Mark

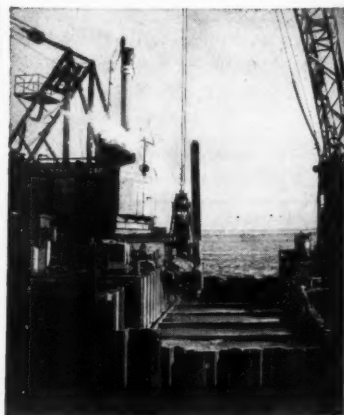
Chemject Corporation
3533 N. Cicero Ave., Chicago 41, Ill.
For more facts, circle No. 330

Save Time on Tough Schedules —

FOSTER RENTAL PILING

A phone call to Foster will provide exact sections of steel-sheet Piling you need. You can always depend on L. B. Foster Company for the piling you specify—in the exact lengths required—and on time deliveries.

You'll save time, speed-up pile driving operations and better your job schedules when you Rent Your Piling from L. B. Foster Company.



Foster Rental Piling forms cofferdams used in construction of the piers for the MULLICA RIVER BRIDGE Garden State Parkway

FOSTER RENTAL PILING

Contractors everywhere save on all their piling needs with prompt, exacting service from L. B. Foster Co. Foster's Rental Plan provides a low, fixed expense—gives you an extra advantage in competitive bidding.

STEEL-SHEET PILING • H-BEARING PILE
H-S LIGHT WEIGHT PILING • PIPE PILES



WRITE FOR
CATALOGS C-2

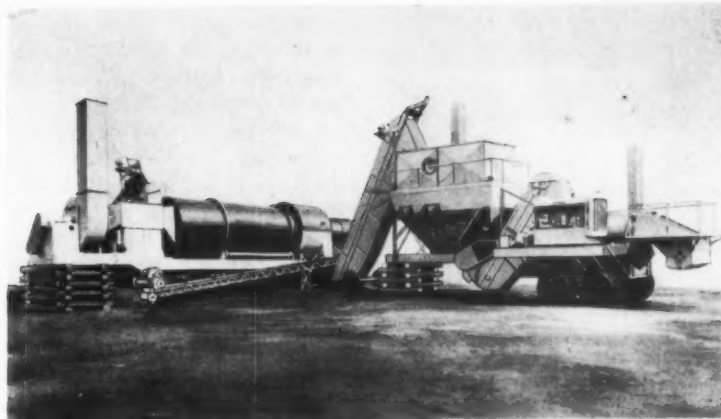
RAILS • TRACK EQUIPMENT • PIPE • FABRICATION
L.B. FOSTER CO.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

For more facts, circle No. 331

CONTRACTORS AND ENGINEERS



TRANSIT-MIXER CARRIER: Mixer-Master Model MC-625 has all-welded 12-inch Manten wide-flange H-beam frame, offset cab, 15,000-pound front axle, heavy-duty overload-type front springs. International 182-hp engine. Handles maximum legal payloads with ease. For details circle No. 69 on card at page 18, or write to Crane Carrier Corp., Box 5008, Tulsa, Okla.



ASPHALT PLANT: Redesigned Model 102 features increased adaptability made possible by a four-compartment bin which allows greater latitude of and flexibility in composition of aggregate fed to the mixer. Production: up to 200 tons per hour. For details circle No. 75 on card at page 18, or write to Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.

Treatment for burns offered in spray cans

■ Relief of pain and prevention of infection from fire, electricity, sun, or hot water burns is provided by a new easily-applied solution offered by E. D. Bullard Co. The product is



Quick relief for burns is provided by Bullard's new F. O. B. spray compound.

called F. O. B. (First on Burns), and is packaged in 3, 5, and 11-ounce spray containers.

The compound is non-toxic, non-irritating, and contains no harmful drugs or acids. It is safely used on any part of the body. Application by means of the aerosol spray rapidly relieves the pain.

The spray cans of F. O. B. are handy for keeping on the job at all times, as they will fit in glove compartments, in tool kits, or in medicine chests. The spray is included in the Bullard F. O. B. Burn Spray kits.

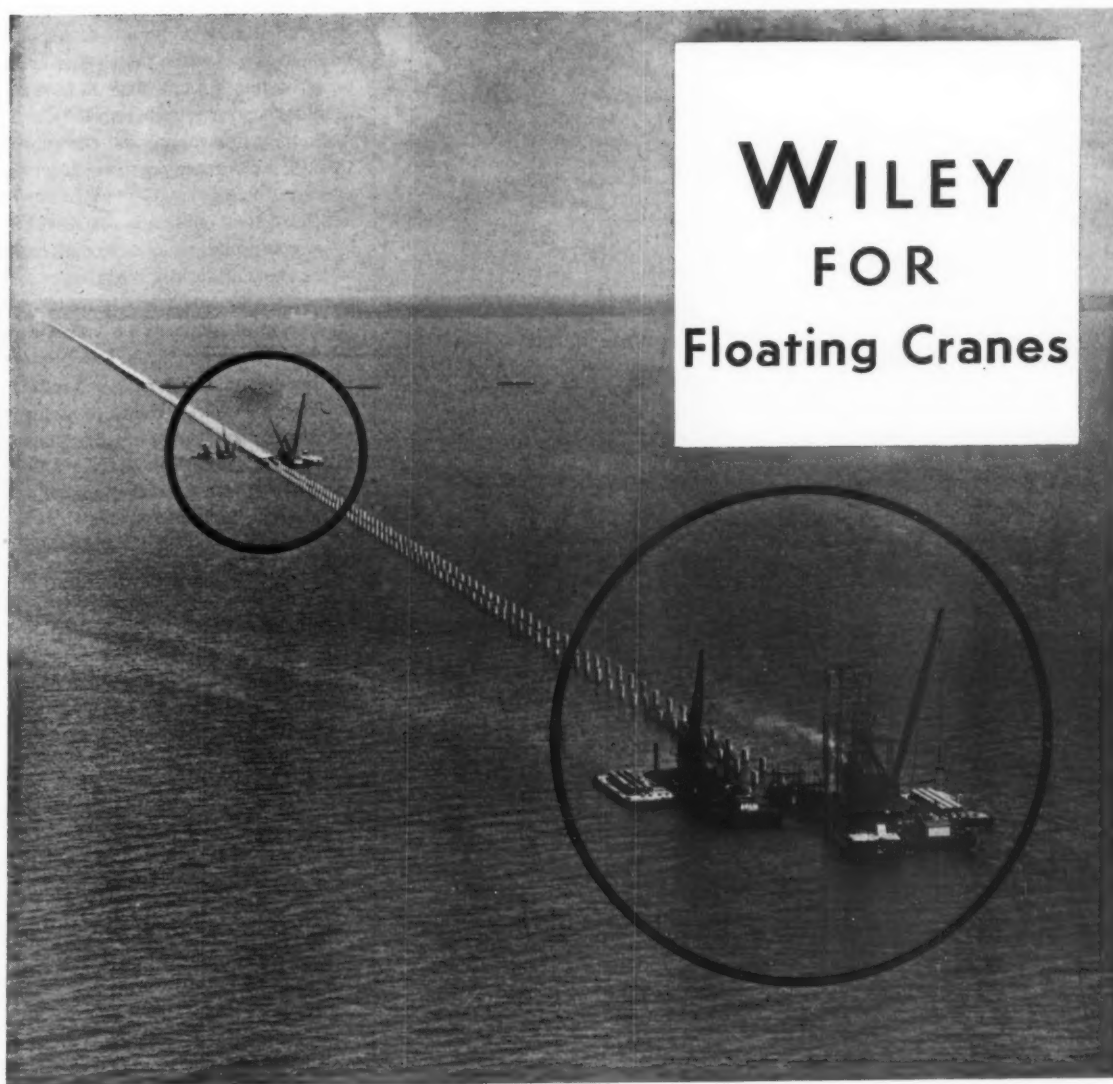
For further information write to the E. D. Bullard Co., 275 Eighth St., San Francisco 3, Calif., or use the Request Card that is bound in at page 18. Circle No. 124.

Surveying equipment

■ Engineers' and surveyors' transits, levels, and planimeters are detailed in a folder from Umeco Optical Division. The company's 5½-inch Model 550; 5-inch Model 100; 18-inch dumpy level Model 180; 11-inch builders' Model 110; and 7½-inch compensating planimeter are described.

To obtain this folder write to Umeco Optical Division, 465 California St., San Francisco 4, Calif., or use the Request Card at page 18. Circle No. 47.

FEBRUARY, 1956



WILEY FOR Floating Cranes

Construction progress continues on the Lake Ponchartrain Causeway, three of four Model 124 Wiley Floating Cranes owned and operated by the Louisiana Bridge Co., are illustrated, serving this construction program.

For dependable Floating Equipment, discuss your requirements with Wiley Engineers.

WILEY MANUFACTURING COMPANY

BARIUM STEEL CORPORATION SUBSIDIARY

P.O. BOX 97, PORT DEPOSIT, MARYLAND

PHONE: PORT DEPOSIT DRAKE 5-2111

For more facts, use Reader-Reply Card opposite page 18 and circle No. 332

After finishing lunch, a ready-mix truck operator makes a routine check on the main office with an RCA Carfone-450 UHF mobile radio. Clifton Concrete & Supply Co., Lakewood, Ohio, now has 45 of these units in its rolling fleet. ▶

C48

Mobile radio pinpoints moving concrete trucks

Supplier of construction materials and concrete saves time by using two-way radio for county-wide check on working units



— with hand tools on the job or in the shop?

Porter hand power cutters cut up to and including

3/4" bolts — hard or soft
3/4" chain
5/8" rod
3/4" wire rope
as well as steel strapping, insulated cable, spring wire, etc.

➔ **SEND** for this book which shows materials to be cut and cost comparisons between cutting methods. It may save you money.



H. K. PORTER, INC.
Somerville 43, Mass. Dept. E-2

Please send me my copy of "CUTTING METALS THE EASY WAY".

NAME _____
COMPANY _____
STREET _____
CITY _____ STATE _____
MY DISTRIBUTOR IS _____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 333

Smoother, more efficient, and time-saving operations—the result of a two-way radio system linking the mixing concrete batch plant and ready-mix trucks—have more than offset the initial cost of the installation for Clifton Concrete & Supply Co., Lakewood, Ohio. With the system, the firm's main office is able to keep a constant check on all rolling stock operating throughout Cuyahoga County and to reroute trucks as needed.

After a load of concrete is received by a ready-mix truck and delivered to its destination, the truck operator is required to call into the main office. He calls again as he leaves the job. Drivers also call when they stop for lunch and when they get rolling again. This allows them to deliver concrete, drive to a nearby diner, call their location in to the office, then drive back to the plant.

Each call is acknowledged by the office. Trucks delivering builders supplies such as bricks, cement, and cement blocks, call in on reaching or leaving a customer. These calls are acknowledged by the builders-supply office located in the batch plant yard at Brook Park Road, Cleveland. The main office in Lakewood, acknowl-

edges only concrete batch truck and emergency calls.

If for any reason, a batch truck is delayed, the office is notified so that another truck enroute to the same job can be diverted to another project by the dispatcher, who thus prevents two trucks from being tied up. However, if a customer requires a large amount of concrete in a hurry, the office can, after being notified, divert trucks from other projects to this single job.

Mobile and base units

The company's radio system, which at present includes 45 RCA Carfone-450 UHF mobile radios, two base stations, and three remote setups, was first installed in February 1954, and it has been growing ever since as rolling stock has been added by the organization.

One of the base stations, using a 65-foot tower, is mounted on top of the Keith Building in downtown Cleveland; the other is atop the company's batch plant. Since the firm operates throughout the country, these two base stations were almost a necessity for handling main office remote signals over the area.

The three remote stations, one at

CRAWLER TRACTOR SPROCKETS - MASTER PINS
REMOVED in MINUTES in the field




with **ONE**
HYDRAULIC PULLER

OTC

One man can remove a Crawler Track Master Pin or a Sprocket or both in mere minutes with the OTC Hydraulic Puller and Attachments. Available in 50 ton or 100 ton capacities these versatile sets are easily and quickly put to work in the shop or field. Hand or electric pumps are available...

The OTC POWER-TWIN HYDRAULIC UNITS are also easily adapted to pull, bend, straighten, press or spread—pull or install bearings, sheaves, gears or pulleys on all types of contractor equipment. Quickly pay for themselves in man hours saved. For the complete story on the OTC Hydraulic line write for Bulletin HY-55.

OWATONNA TOOL COMPANY
381 CEDAR STREET • OWATONNA, MINNESOTA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 334

CONTRACTORS AND ENGINEERS

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the main office in Lakewood, one at the garage in the Brook Park plant, and the third at the builder's supply office at the plant's yard, are all linked together for the swift coordination needed in this type of business.

Mobile units are installed in the Rex and Jaeger truck-mixers, builders-supply trucks, supervisor's automobiles, and in the service truck and winch truck. The maintenance and service of the RCA mobile and base units is handled by RCA technicians. Working under a service contract, they perform any work required to keep the sets in top condition at all times.

Fast shuffling possible

The handling of mechanical breakdowns has been made swift and sure, largely because the main office is constantly aware of the position and condition of all units operating on the road. Once notified that a truck is disabled, the office can dispatch another ready-mix truck to meet the customer's needs, while the service truck is sent out to the disabled vehicle from the garage. Since the winch truck is equipped with mobile radio, it is easy to send this rig from

one location to another to assist vehicles that have bogged down. In one instance, while a loaded ready-mix truck was bogged down in mud, the winch truck was miles away. Shortly after receiving the distress call from the bogged truck, the office got a routine call from another ready-mix truck that had just delivered concrete. The empty truck was only a few miles away, so it was sent to the aid of the bogged vehicle. In a matter of minutes the loaded truck was out of the mud and able to deliver its concrete.

Without radio communication, it would have been necessary for the driver of the disabled truck to find a telephone and notify the office. Then, if the winch truck were not available, the mixer would have had to dump its contents to prevent concrete from setting in the mixer.

A daily time saving comes at the end of each work day, when the last concrete truck needed for a customer's daily operation calls the office. If no more concrete is needed for the day, the operator, following normal procedure, calls the office and relays this information. As soon as all the concrete truck operators call in to notify the office that the last delivery

has been made, cleanup operations begin at the batch plant. This allows the plant to be shut down and washed before all the trucks return.

Before the radio system was installed, much time was lost because cleaning operations had to wait until the last truck returned from a job and the operators reported that no more concrete was needed.

All the time being saved in regular operations will more than pay for the RCA installation, according to officials of Clifton Concrete & Supply Co. The firm, founded in 1924 by president George Goetz, Sr., and now one of the major suppliers of concrete and building materials in the Cleveland area, also owns Fort Myers & Naples Ready-Mix Concrete Inc., Fort Myers, Fla., which has a similar

RCA installation that is more than paying its own way. **THE END**

Hensley adds new dealers

Seven new distributors of its line of dozer and scraper rippers, cutting edges, bottom track rollers, and allied tractor replacement parts have been appointed by Hensley Equipment Co., Inc., San Leandro, Calif.

In California, Contractors Equipment & Supply Co., Fresno, and Doug-Lynn Mfg. & Machinery Co., Santa Rosa, will handle the line. The W. L. Johnson Machinery Co., Midland, Texas; R. A. Young & Son, Tulsa, Okla.; Complete Industrial Supply Co., Phoenix, Ariz.; and Wenzel Machinery Rental & Sales, Kansas City, Kans., have been named



New Optical Plummet Built into Gurley Transit Saves Set-up Time, Improves Accuracy on Windy Days

Instrument Available in Two Models with Shifting Heads

Years ago, Gurley introduced lightweight instruments to combat wind vibrations. Now Gurley further beats the wind problem with an optical plummet *built into* the instrument.

The new Gurley Optical Plummet Transit eliminates swing and sway of the cord and plumb—always time-consuming and exasperating on a windy location, and inaccurate as well. Positive accuracy of set-up is assured with the Gurley Optical Plummet.

Two types of shifting head are available: one, which uses the Gurley wide-frame tripod, is adjusted over the point—using a method similar to the theodolite...the other, featuring a slow-motion, two-direction cross-feed head, permits movement in two directions at right angles to each other without disturbing the level of the plate.

Gurley's new Optical Plummet Transit offers one of the advantages of the optical-reading theodolite *plus* the desirable features of simplicity and universal acceptance of the American transit. For further details, write for Bulletin OP-57.



W. & L. E. Gurley, Fulton & Station Sts., Troy, New York

Gurley—Since 1845

For more facts, use Reader-Reply Card opposite page 18 and circle No. 336



NOW OVERHEAD PLUS FRONT-END LOADING COSTS NO MORE with LODOVER!

This versatile combination overhead and front-end loader costs no more than conventional front-end loaders...yet loads more dirt, faster with your International T-9 or TD-9 than any other loader on the market today!

ONLY LODOVER GIVES YOU

- 50% MORE YARDAGE—no-turn overhead operation eliminates two turns every cycle, doubles yardage every hour
- EXTRA DIGGING POWER—twenty-five degree bucket tilt-back at ground level pries out a full bucket every time
- REDUCED TRACTOR MAINTENANCE • SAFE, EASY HYDRAULIC OPERATION • HIGH-SPEED FRONT-END LOADING

- A complete line of job-tested attachments makes Lodovert the most versatile multi-purpose unit you can buy to boost profits on your job. An on-the-job Lodovert demonstration will convince you... arrange for one today!

SERVICE SUPPLY CORPORATION
20TH & ERIE AVENUE • PHILADELPHIA, PA.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 335

FEBRUARY, 1956

Distributor delays

exclusive dealers in their areas.

One Canadian firm, Columbia Equipment Ltd., Vancouver, British Columbia, was also named.

Garlinghouse, Fremon will open dealership

A new dealership, Garlinghouse, Fremon & Co., is due to open for business at 6046 E. Washington Blvd., Los Angeles, Calif., on March 1. The firm is a successor to the retail division of Garlinghouse Bros. of Los Angeles.

John L. Fremon will serve as president, and A. F. Garlinghouse will be chairman of the board of directors.

North Jersey Equipment marks tenth anniversary

It almost seems as if North Jersey Equipment Co., Inc., is sticking to a close schedule when it comes to enlarging its facilities. In celebrating its tenth anniversary in business November 18 and 19, the dealer, located at 450 U. S. 1, Newark, N. J., also celebrated its second big expansion in a decade.

When founded by Ben Chernin in a garage at 343 Elizabeth Ave., Newark, in July, 1945, the firm had only one salesman, one serviceman, and one bookkeeper on its staff. Five years later, in 1950, the firm made its first big move—taking over its present site on U. S. 1.

Just a little more than a month ago,

the firm held an open house marking not only its tenth year in business, but also another expansion. The new addition to its facilities gives the firm a larger shop, expanded parts department, and modern office and display rooms to show off equipment by more than 25 manufacturers, including American, Anderson, Baker-Lull, C. H. & E., Flink, Gilson, Gledhill-Elliott, and Homelite. The big parking lot adjacent to the buildings makes it convenient for customers to drop in.

The size of the firm's sales staff has been growing too. Ben Chernin, president, now gets an able assist from his son Arthur, vice president of the firm, and L. J. Selzer, secretary-treasurer. The sales staff includes six men—J. Ross Murray, Jack Smith, Edward Hays, Thomas Horan, Jr.,

Edward O. Delmastro, and Merlin Pettitt. They handle sales in counties and special markets of equipment made by such firms as Manitowoc, Meyers, Minneapolis-Moline, Muller, Novo, Pettibone-Mulliken, Schramm, Thor, Sicard, Unit, Wausau, Wayne, Wright, Ingram, Oshkosh, Ottawa, and Overman.

The service staff for North Jersey includes Wilfred Hendrickson, service manager; Russell E. Reed, shop foreman; and Wilbur Schickel, parts manager. Field service is in the hands of Charles Neidlinger.

Detroit Diesel appoints two new dealers

The Hubbs Engine Co. of Cambridge, Mass., has been appointed a distributor of marine and industrial diesel engines by the Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich. The company will serve the states of Massachusetts, Rhode Island, Maine, New Hampshire, and part of Connecticut.

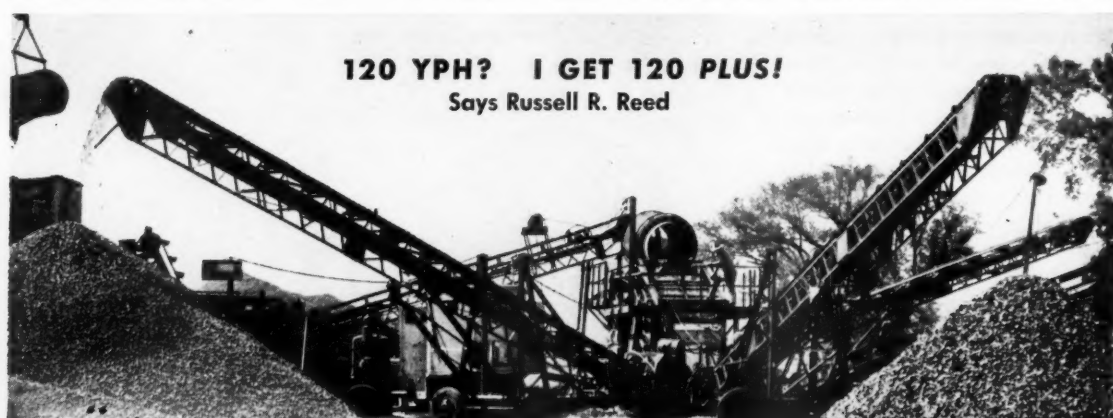
The Gil Boers Equipment Co., Chicago, has been appointed a distributor of industrial and marine diesels in northern Illinois by the Detroit Diesel Engine Division. The firm will handle both sales and service from its headquarters at 7739 S. Kedzie St., Chicago.

E. K. Cook is manager of Boers' diesel division, and N. D. Cacic is parts and service manager.

Moore Equipment names two

The W. H. Moore Equipment Co., Denver, Colo., has appointed Onslow Sappington and Gene Stout to its sales staff. Mr. Sappington will work from the company's home office in Denver, while Mr. Stout will make his headquarters at Moore's branch office in Grand Junction, Colo.

120 YPH? I GET 120 PLUS!
Says Russell R. Reed



"Naturally I am more than satisfied with Lippmann production..."

Gentlemen:
When I bought your portable washing plant just about a year ago your literature claimed it was capable of producing washed material at a rate up to as high as 120 YPH... actually I get more. I claim 120 YPH plus... and this from a deposit having only 40% stone. With a 50-50 deposit I would go way over. Naturally I am more than satisfied with Lippmann production.
(Signed) Russell R. Reed

LIPPMANN Portable Washing Plants Will Do More For You

Like Mr. Reed, you will find that Lippmann Portable Washing Plants give you more capacity and real drive-it-to-the-job profits. There's a choice of two models to meet your needs—the WASH-MORE with capacity up to 80 yards per hour and the SUPER-CAPACITY—the only washer with enough capacity (120 cu. yd. per hour) to keep up with a double drum paver.

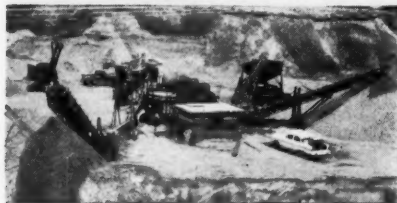
These rugged plants are built to give you long service. Heavy frames need no blocking. Larger components perfectly coordinated with each other produce three sizes of gravel and one of sand. Both models use a 3-deck eccentric vibrating screen—far superior to revolving screens used on conventional units. The Sand Drag has a larger settling pool to recover more sand and deliver dryer sand. All of which adds up to one thing—greater opportunities for lower bids at more profits.

Why not look into the possibilities of one of these plants for your operations—like Mr. Reed, learn how Lippmann engineering pays off with higher capacity, cleaner product, accurate sizing, greater sand recovery and reduced maintenance. Lippmann Engineering Works, 4637 W. Mitchell Street, Milwaukee 14, Wis.

1650-56-2



Lippmann Super-Capacity plant—a champion with a champion's look.



Above and below are views of other Lippmann portable washing plant layouts in operation in Northern Illinois and Southern Wisconsin.



LIPPMANN

CRUSHERS FEEDERS SCREENS CONVEYORS CRUSHING & WASHING PLANTS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 337

INDIAN
DRINKING WATER & SUPPLY TANK NO. 75G



Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers: right on the job. 5 gal. steel tank is curved to fit the back. Sturdy construction. Highly popular.

SMITH
GARDEN KING
Low-priced power
Sprayer
12 gallon capacity
For spraying silicon
water repellents for
masonry and cement
work and many other
spraying purposes.
Briggs and Stratton
Motor. Very high quality.



D. B. SMITH & COMPANY
"Choice for Quality the World Over"
470 Main St., Utica 2, New York

For more facts, circle No. 338
CONTRACTORS AND ENGINEERS

nd Merlin
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equipment
Manitowoc,
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Benjamin Equipment Co. occupies new quarters

A modern warehouse and office have been erected at 2300 McCoy's Blvd., Jacksonville, Fla., for the Julien P. Benjamin Co. Constructed of concrete block with a poured slab floor, the 14,000-square-foot warehouse has a ceiling height of 16 feet. Provision has been made for the addition of a mezzanine floor.

The office, 5,000 square feet in size, is completely air conditioned. Ceilings are acoustically treated, and a plate-glass-enclosed showroom adjoins the office.

The company, handling a variety of well known construction machinery in the Jacksonville area for the past 35 years, is headed by its founder Julien P. Benjamin, Sr., and his son, Julien, Jr.

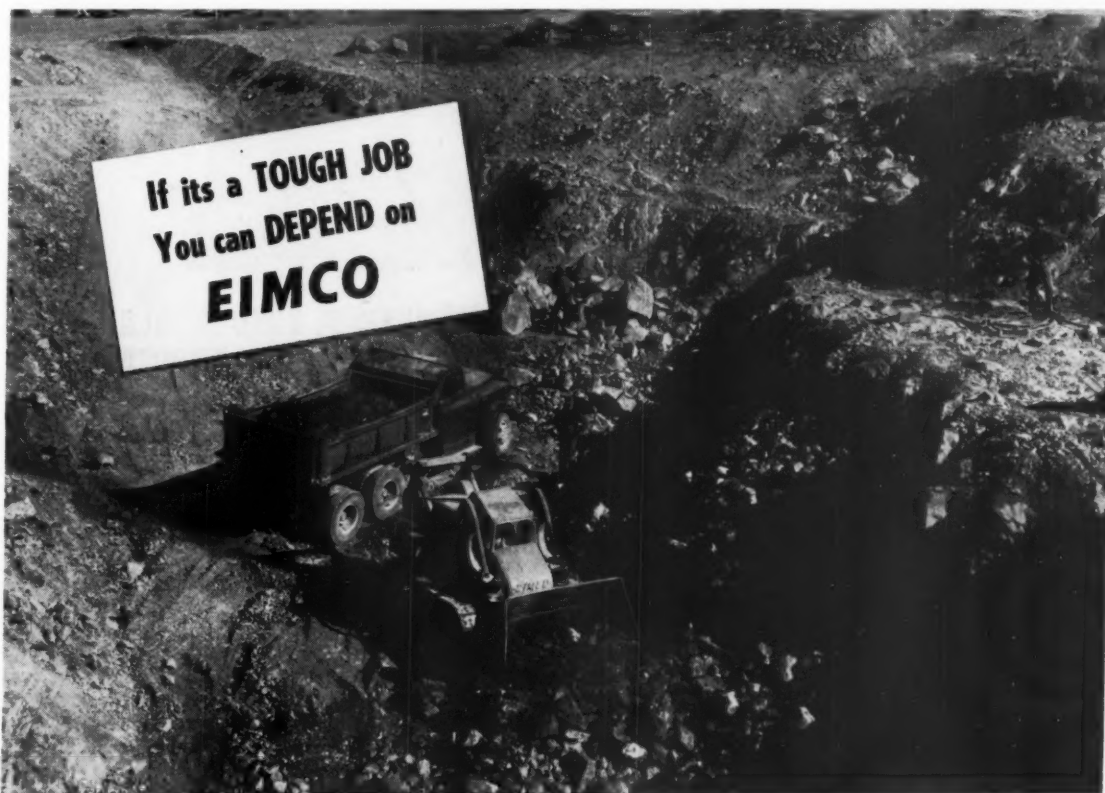
E. H. Kliebenstein Co. names new sales manager

W. W. Layng has been appointed sales manager of E. H. Kliebenstein Co., Ridgefield, N. J. Engaged in machinery sales since the end of the first world war, Mr. Layng had been associated with manufacturers and with other equipment-distributing firms in the metropolitan New York area. In 1930, he headed his own distributorship in Springfield, N. J.

Since January, 1955, he has handled

(Continued on next page)

Above, the new office and warehouse of the Julien P. Benjamin Co., Jacksonville, Fla., equipment distributor. At right, Julien P. Benjamin, Sr., and Julien P. Benjamin, Jr., check the blueprints for their new building.



Hard, Tight, Blocky Tungsten Ore Loaded by Eimco Tractor-Excavator

Location: Nevada
Haulage Equipment — 2 - 20 ton trucks

Trip — 2,000 feet each way
Present Production — 200 tons per hour

Machine Capacity — Idle 40-50% of time waiting for trucks

Operation — Machine loads 20 ton trucks from pit 3 mins. each,

loads 20 ton trucks from stock pile 1½ mins. — also used to load waste from around mill, loading concentrates and as a prime mover for heavy machinery and supplies.

Report — The solid rough bottom in the pit is hard on tracks and rollers but to date no troubles have been reported. Operators say "It's much better than a shovel because there's no swing and I don't have to be square with a truck to load it. I can load from almost any angle. It's really built, you can't hurt it." Owners say — "It's doing all that was said for it and it's a most versatile machine. It has a thousand and one uses. We use it for many different jobs besides ore excavation including loading waste at the mill, for fill around the

camp, loading concentrates and even as a come-a-long when handling heavy machinery and supplies."

This mine has four other Eimco loaders underground and know that Eimco's are built to handle the tough jobs.

Eimco's are made simple for easy handling and easy maintenance. All parts on the Eimco are alloy steel, cast or fabricated. The Eimco 105 Tractor-Excavator is designed for years of service. Many reports show 30%-100% longer service life with an increase in production of 25% to 400% over comparable equipment.

Before you buy — do yourself a favor — compare the Eimco with any other equipment.



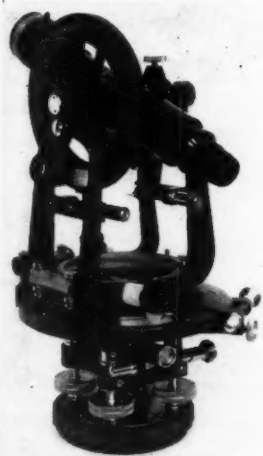
THE EIMCO CORPORATION
Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas Vancouver, B. C. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

For more facts, use Reader-Reply Card opposite page 18 and circle No. 340



B-172



UMECO 5 3/4" SURVEY TRANSIT

Model 575 Only \$450.

PRECISE • RUGGED • RELIABLE

Fully Guaranteed

Complete line of transits, levels, compasses, planimeters. Folder on request.

UMECO OPTICAL DIVISION
465 California San Francisco, Calif.

Exclusive Western Distributor:
A. Lietz Co., 840 Post, San Francisco
1224 S. Hope, Los Angeles

For more facts, circle No. 339

FEBRUARY, 1956

distributor doings

the M-R-S account exclusively for the firm.

Galion names dealer for western New York

The Maday Body Works, 38 A St., Buffalo, N. Y., has been appointed distributor for the western New York area by the Galion Allsteel Body Co., Galion, Ohio.

A full line of Galion dump bodies, hydraulic hoists, Load-elevator hydraulic and electric endgates, as well as a complete supply of service parts will be stocked. Walter and Henry Maday head the firm.

Hough expands dealerships

The Frank G. Hough Co., Libertyville, Ill., has appointed new distributors and expanded the territories of those already handling the Payloader line of tractor-shovels and tractors.

Phillippi Equipment Co. will handle the state of Minnesota from headquarters in Minneapolis and branch offices in Duluth, Hibbing, and Moorehead. The entire state of Ohio will be served by Rish Equipment Co., with plants in Cleveland, Columbus, Dayton, Toledo, Cincinnati, and Portsmouth.

From headquarters in Sioux Falls and a branch office in Rapid City, S. Dak., the J. D. Evans Equipment Co., will service the entire state. Orton Equipment Co. is the new Hough

distributor at Stratford, Calif.

The southern Illinois area has been added to the territory of Brandeis Machinery & Supply Corp., Mt. Vernon, Ill., and the state of Vermont will be handled by State Equipment Co., Montpelier.

Clark Equipment names two new distributors

The construction Machinery Division of Clark Equipment Co., Benton Harbor, Mich., has appointed two new dealers to handle its Michigan line of shovels and cranes. The distributors, J. W. Burrell, 100 Waughton St., Winston-Salem, N. C., and Sheehan-Bartling, Inc., W. 12th St., Sioux Falls, S. Dak., will sell and service the line in their respective states.

Hyster dealer news

Hyster Co. of Louisiana, Inc., 327 N. Diamond St., New Orleans, has changed its name to Hyster Sales & Service, Inc. At the same time, Modern Handling Equipment Co., 4200 Sansom St., Philadelphia, succeeded Rapistan of Pennsylvania, Inc., as Pennsylvania representative. Both firms represent the Hyster Co. of Portland, Oreg.

convention calendar

February 13-15 Association of Asphalt Paving Technologists

Annual Meeting, Hotel Cleveland, Cleveland, Ohio. Ward K. Parr, secretary-treasurer, AAPT, 1224 East Engineering Bldg., Box 376, Ann Arbor, Mich.

February 13-16 Associated General Contractors of America

Meeting, Waldorf-Astoria Hotel, New York, N. Y. I. Mehl, administrative assistant, AGC of America, 1227 Munsey Bldg., Washington 4, D. C.

February 13-16 National Ready Mixed Concrete Association and National Sand and Gravel Association

Meeting, Conrad Hilton Hotel, Chicago, Ill. Vincent P. Ahern, executive secretary, NSGA, 1325 E. St. N. W., Washington 4, D. C.

February 13-17 American Society of Civil Engineers

Meeting, Baker Hotel, Dallas, Texas. I. W. Santry, general chairman, associate professor of civil engineering, Southern Methodist University, Dallas.

February 13-18 Danish National Institute of Building Research

Rilem Symposium on Winter Concrete, Danish Institute of Civil Engineers, Copenhagen, Denmark. The Organizing Secretary, Rilem Symposium of 1956, c/o The Danish National Institute of Building Research, 20 Borgergade, Copenhagen K, Denmark.

February 14-17 High-Speed Computer Conference

Meeting, Louisiana State University campus, Baton Rouge, La. Dr. Leon C. Megginson, associate professor of business administration, College of Commerce, Louisiana State University.

February 17-18 National Society of Professional Engineers

Spring Meeting, Statler Hotel, Washington, D. C. Paul H. Robbins, executive director, NSPE, 1121 15th St. N. W., Washington 5, D. C.

February 20-22 National Crushed Stone Association

Thirty-ninth Annual Convention in conjunction with NCSA Manufacturers Division Exposition, Conrad Hilton Hotel, Chicago, Ill. J. R. Boyd, secretary, NCSA, Manufacturers Division, 1415 Elliot Place, Washington 7, D. C.

February 20-23 American Concrete Institute

Meeting, Bellevue-Stratford Hotel, Philadelphia, Pa. William A. Maples, secretary-treasurer, ACI, 18263 W. McNichols Road, Detroit 19, Mich.

February 23-24 Highway Engineering Conference of University of Colorado

Conference, University Memorial Center, Boulder, Colo. Roderick L. Downing, conference chairman, 207 Engineering Bldg., No. 1, University of Colorado, Boulder.

February 23-25 Concrete Contractors Association

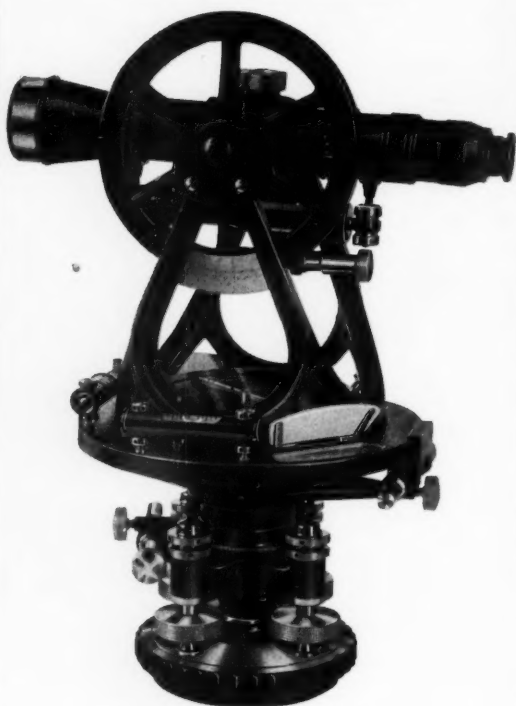
Midwest Concrete Exposition, Morrison Hotel, Chicago, Ill. Ted Dahlstrom, managing director, MCE, 139 N. Clark St., Chicago, Ill.

February 27-March 2 American Society for Testing Materials

Committee Week, Hotel Statler, Buffalo, N. Y. Fred P. Van Atta, assistant secretary,

CONTRACTORS AND ENGINEERS

20 Years of Proven Consistency • Accuracy • Service In the United States



Sokkisha Transits

Produced by the foremost manufacturer of engineering, surveying and mapping instruments in the Far East.

These transits are the most popular rental transits in the United States. Knowledge of instruments dictates that a rental transit must be accurate, easily serviced and rugged. Sokkisha Transits have these qualities and more.

The distributors maintain repair and service facilities for all makes of transits, guaranteeing your satisfaction. Sokkisha Transits are distributed through only recognized distributors.

Guaranteed by reliable distributors.

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Denver Blue Print Co.
728 - 14th Street
Denver 2, Colorado

Thorpe-Smith Inc.
308 So. Washington Ave.
Falls Church, Va.

Warren Knight Co.
136 North 12th Street
Philadelphia, Pa.

Carl Heinrich Co.
711 Concord Avenue
Cambridge 38, Mass.

Precise Instrument Co.
15504 Telegraph Rd.
Detroit 39, Mich.

Griner and Schmitz
1701 Broadway
Kansas City 8, Mo.

Engineer Service
2841 Clague Road
Cleveland, Ohio

OPPLEM COMPANY, INC. 83 Uhland Street
East Rutherford, N. J.

For more facts, circle No. 341

PERFORMANCE TEST—NEW JERSEY TURNPIKE**



NEW CARBIDE BONDED* BLADES... ...TRIPLE ASPHALT FOOTAGE!

HARDEST, MOST DURABLE, FASTEST CUTTING ASPHALT BLADE EVER MADE! Sounds like a big order, doesn't it?

Well, it took Consolidated years to successfully put DIAMONDS (nature's hardest material)...in CARBIDE (the hardest and toughest metal man has been able to make). THE RESULT...a versatile asphalt and concrete sawing blade that lasts 2 and 3 times longer than any other ordinary diamond blade. Longer blade life means lower costs (in asphalt a savings of more than 50¢ on the dollar)...lower costs mean lower bids...lower bids mean more contracts...more profits!

Write today for full information and prices.



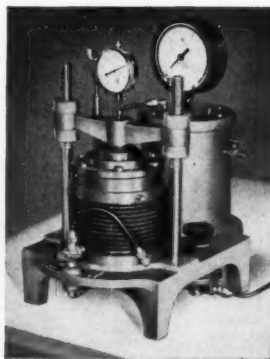
Consolidated
DIAMOND TOOL CORP.
320 Yonkers Avenue, Yonkers, N. Y.

*Patents Pending. **Detailed N. J. Turnpike test available on request.
CONCRETE AND MASONRY CUTTING BLADE DIVISION

For more facts, circle No. 342

For Efficient Consolidation Soil Testing You Need..

an
OLSEN
Conbel



- Infinite choice of loads up to 10 tons per square foot on 2½" dia. sample
- Floating bellows—eliminates eccentric loading
- Instantaneous load application
- Compact—less than 1½ sq. ft. of table space
- Simplified controls—one man operation
- Light weight—portable

For information about the Conbel and other soil testing equipment in the Olsen line, write for Bulletin 50.

TINIUS OLSEN TESTING MACHINE CO.
2100 Easton Road Willow Grove, Pa.

For more facts, circle No. 343

tary, ASTM, 1916 Race St., Philadelphia, Pa.

February 28-29 Illinois Annual Conference on Highway Engineering

Conference, Illini Union Building, University of Illinois, Urbana, Ill. John W. Hutchinson, assistant director, IACHE, 201 Civil Engineering Hall, University of Illinois.

February 29-March 2 Associated Highway Officials of North Atlantic States

Meeting, Statler Hotel, Boston, Mass. Kenneth D. Rice, assistant secretary, AHONAS, 1035 Parkway Ave., Trenton, N. J.

March 5-7 Utah Highway Engineering Conference

Seventeenth Annual Conference, Union Building, University of Utah, Salt Lake City, Utah. A. Diefendorf, conference director, University of Utah.

March 6-10 American Concrete Pipe Association

Meeting, Broadmoor Hotel, Colorado Springs, Colo. Howard F. Peckworth, managing director, ACPA, 228 N. La Salle St., Chicago 1, Ill.

March 12-16 National Association of Corrosion Engineers

Meeting, Hotel Statler, New York, N. Y. A. B. Campbell, executive secretary, NACE, 1061 M & M Bldg., Houston 2, Texas.

March 13-15 Michigan Highway Conference

Meeting, Pantlind Hotel, Grand Rapids, Mich. For reservations, write directly to hotel.

March 18-24 American Congress on Surveying and Mapping and American Society of Photogrammetry

Consecutive Meeting and 1956 Co-exhibit, Shoreham Hotel, Washington, D. C. F. G. Williams, W. A. Radlinski, co-chairmen, ACSM-ASP, 1000 11th St. N. W., Washington 1, D. C.

April 2-5 Purdue Road School

Forty-second Annual Course of Instruction, Memorial Union Building, Purdue University, West Lafayette, Ind. Ben H. Petty professor of highway engineering, Civil Engineering Bldg., Purdue University.

April 3-4 Earth-Moving Industry Conference

Conference, Pere Marquette Hotel, Peoria, Ill. F. Norris, housing chairman, Research Department, Caterpillar Tractor Co., Peoria.

April 3-5 Ohio Highway Engineering Conference

Tenth Annual Conference, Student Union, Ohio State University, Columbus, Ohio. Emmett H. Karrer, general chairman, Brown Hall, Ohio State University.

April 4-6 American Society of Lubrication Engineers

Annual Meeting and 1956 Lubrication Exhibit, William Penn Hotel, Pittsburgh, Pa. W. P. Youngclaus, Jr., administrative secretary, ASLE, 84 E. Randolph St., Chicago 1, Ill.

April 10-13 Western Association of State Highway Officials

Meeting, Westward Ho Hotel, Phoenix, Ariz. William E. Willey, state highway engineer, 1739 W. Jackson St., Phoenix, Ariz.

April 11-13 South Dakota Highway Short Course

Short Course of Instruction, Union Building, South Dakota State College, Brookings, S. Dak. Emory E. Johnson, professor of civil engineering, South Dakota State College.

April 12-14 American Concrete Agricultural Pipe Association

Sixth Annual Meeting, Brown Palace Hotel, Denver, Colo. Howard F. Peckworth, managing director, ACPA, 228 N. La Salle St., Chicago 1, Ill.

April 16-20 Greater New York Safety Council

Twenty-sixth Annual Safety Convention and Exposition, Statler Hotel, New York, N. Y. Paul F. Stricker, executive vice president, GNYSC, 60 E. 42nd St., New York 17, N. Y.

For more facts, circle No. 344-
FEBRUARY, 1956

April 23-25 American Wood Preservers Association

Meeting, Jung Hotel, New Orleans, La. W. A. Penrose, secretary-treasurer, AWP, 839 17th St. N. W., Washington 6, D. C.

May 8-10 Highway Transportation Congress

Sixth Annual Congress, Hotel Mayflower, Washington, D. C. Arthur C. Butler, director, National Highway Users Conference, National Press Bldg., Washington 4, D. C.

Hydraulic power unit used with mobile equipment

■ A compact hydraulic power unit, complete with 6 or 12-volt DC motor

drive, pump, control valve, and tank has been announced by Wisconsin Hydraulics, Inc. The Lectro-Lift is designed for application on mobile equipment such as snow plows, hoists, booms, and tail gates.

A rectangular housing of cast aluminum serves as the reservoir for 110-cubic inches of oil. The electric motor is flange-mounted to one end of the housing and the pump control valve to the opposite end.

One lever, which can also accommodate a clevis for remote control linkage, provides full control.

For further information write to the Wisconsin Hydraulics, Inc., 3165



The Lectro-Lift hydraulic power unit has been designed for mobile equipment.

North 30 Street, Milwaukee 16, Wis., or use the Request Card at page 18. Circle No. 128.

Remember Safety is no accident.



D Tournapull Rear-Dump's ability to turn around in only 24'8" enables it to spot fast in tight quarters. With 10 to 11 passes of 3/4-yard shovel, unit loads 8 pay yards in about 3 minutes. Big 10'11" x 5'10 1/2" bowl opening, with low rear entry, makes loading easy.

Hauling from pit to crusher, "D's" average 900' distance in 1 1/2 minutes...returning in about 55 seconds. Units' 4-wheel multiple-disc airbrakes assure positive control at all times...give operators complete confidence on winding roads and steep grades.



"Better than trucks where going is tough"

says Superintendent R. E. Merritt of Oregon's Jackson County

To speed delivery of rock from quarry to crusher, Jackson County Highway Dept. teamed up 2 D Rear-Dumps to handle all crusher requirements.

On the job the "D's" encountered tight loading quarters, rough quarry terrain and underfooting, and adverse grades on haul roads. Unit's speed and maneuverability, plus ease in spotting in restricted places, helped keep crusher well supplied with rock at all times.

1800' cycle in 9 1/4 minutes

When pictures were taken, the 11-ton "D's" had already moved 28,000 yards of rock to the crusher. Time studies showed that each "D" was averaging 8 pay yds. per load...1800' cycles were completed in about 9 1/4 minutes, including 3.65 min. to load and a 3.95 minute waiting time.

"Work in closer quarters"

Comparing the operation of the Rear-Dumps to trucks, Supt. Ralph E. Mer-

ritt said, "The D Rear-Dumps are a lot better than trucks where the going is tough." Operator Floyd Sherman added, "'D's' can get around in a lot closer quarters, too."

Safer than trucks

Besides being faster and more maneuverable than ordinary trucks on rough roads, D Rear-Dumps are also safer when dumping loads. Front-wheel-drive on "D's" keeps power and traction on solid footing well ahead of rear wheels. Because body does not need to clear frame, springs, axle, or differential, its center of gravity stays low, even during dumping. Over-size multi-disc airbrakes—with more braking surface on one wheel than comparable-size trucks have on all four—prevent creeping or rolling, especially when dumping.

If you have a tough hauling job...better check D Rear-Dump's advantages for yourself. See how the 11-ton "D", 22-ton "C" or new 35-ton "B" can help you.

Tournapull—Trademark Reg. U.S. Pat. Off. DR-903-P-b



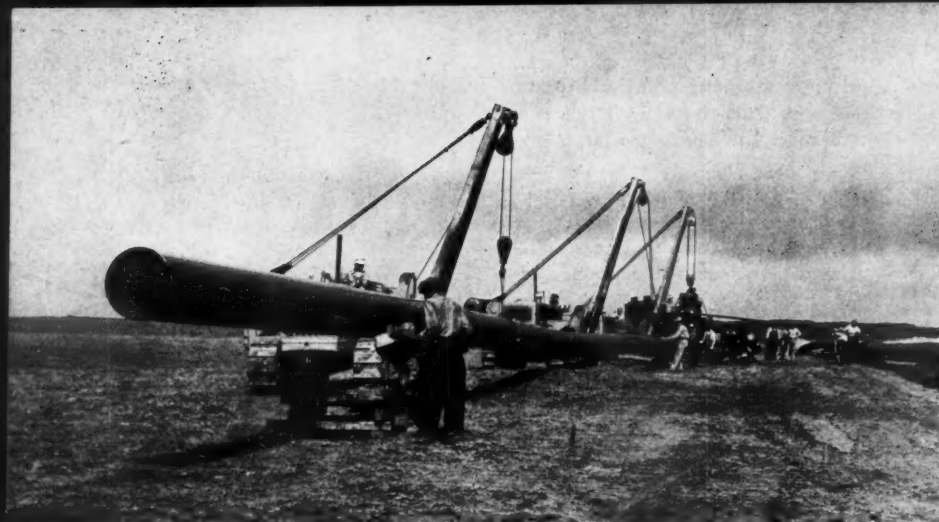
At crusher, "D" dumps 8-pay-yard load in 20+ seconds. Operator Floyd Sherman said, "You can get around in a lot closer quarters with 'D's' than you can with a truck." He added, "These D Rear-Dumps are not as hard on the operator as many other types of haulers."



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company



Caterpillar tractors support a long section of the 22-inch line with Trackson side booms during wrapping. Once wrapped, the pipe is cradled in heavy straps to prevent the protective material from being damaged.

Two miles of pipe are strung daily in mountainous country

Welding, wrapping units stay close together in work on 140-miles of 22-inch gas line

Difficult trenching in granite and auger boring under highways and railroads have failed to slow the pace of Houston Contracting Co., Houston, Texas, in the construction of a 140-mile 22-inch gas line in Colorado and Wyoming. Even in rough terrain, the pipeline firm has laid as much as 12,000 feet per day on the new line it is building for Colorado Interstate Gas Co., Colorado Springs.

The line will eventually link gas supplies in Denver with those in Rock Springs, Wyo. The present contract calls for construction of the line between Denver and a point near Laramie, Wyo. In this 140-mile stretch, the line will pass through farming country on the east slope of the Rockies, curve up to a point near Cheyenne on the Wyoming-Colorado border, then head west through terrain as high as 9,000 feet above sea level on its way toward Laramie.

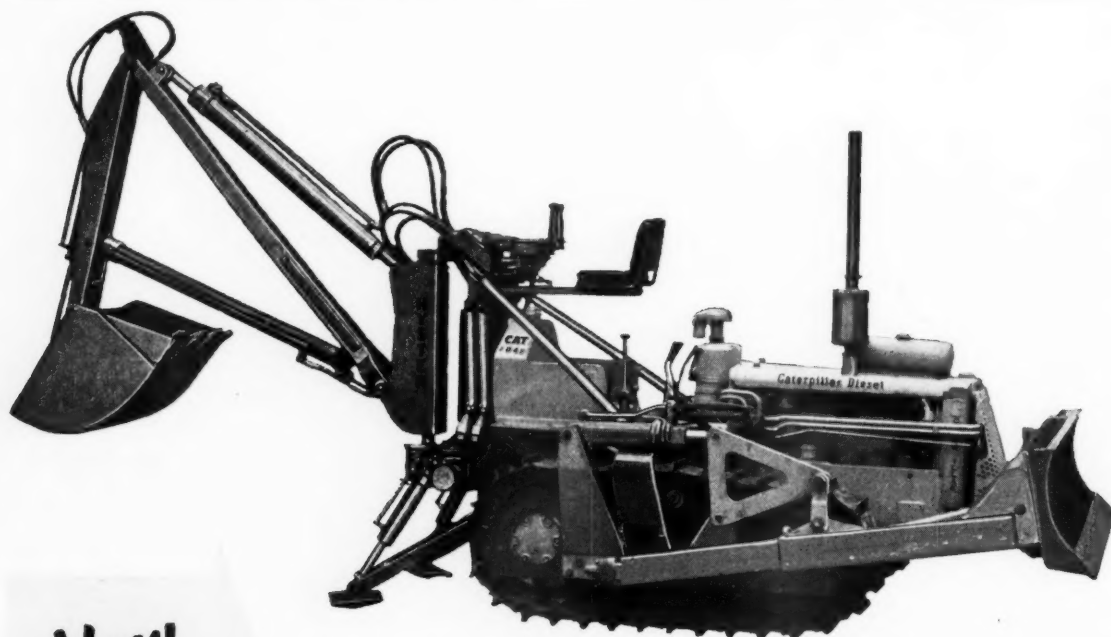
Right-of-way work, fencing, and trench excavation started at the Laramie end on June 10 under superintendent M. L. Thompson of the pipeline company, and by July 6, when the pipelaying crews were ready to work, about 25 miles of ditch had been completed. Work had been planned so that trenching crews reached the agricultural country around Greeley, Colo., at a time when crops would no longer require extensive irrigation and ground water would not be a problem.

Right-of-way preparation

The orderly and well-timed sequence of operations started with the clearing of brush and trees on the 50-foot right-of-way. At the same time extensive grading required by the roughness of terrain was started. In some places 15-foot-deep cuts were required to provide access for equipment and to establish a working area near the trench site.

The workhorse of the grading fleet was a Caterpillar D8 tractor equipped with bulldozer and a heavy Kelley single-tooth ripper. Reaching down into tough formations with this plow-type ripper, the machine was able to loosen formations which otherwise might have required drilling and blasting.

Assisting this machine were two more D8's with dozers, two D7's and one D6. At one time in the high mountainous area southeast of Laramie, all of this equipment was working simultaneously on the right-of-way. To the east, where the line passes through agricultural land, right-of-way work and trenching are



New

HYDRAULIC D-4 BACKHOE

A MAJOR ADVANCE IN THE TRACTOR-MOUNTED BACKHOE FIELD

1 1/2 yard capacity

HYSTER — The Only Backhoe Designed Specifically for the Caterpillar D-4 Tractor

The new Hyster D-4 Backhoe digs anywhere a track-type tractor can go! Digs down to 13 feet, loads up to 9' 7 1/2".

You get these outstanding operating benefits:

3 Dippers Available — giving 13", 21" and 29" cutting width. Equipped with replaceable alloy steel points crimped onto adapters from bottom for easy replacement.

Retractable Hydraulic Outriggers provide full machine stability. Can be raised to allow 17" clearance in travel.

Convenient Controls make possible easy, fast operation—with full visibility from high, comfortable operator seat.

... Plus many other advanced features, making the Hyster Hydraulic D-4 Backhoe one of the fastest, most profitable digging machines available, regardless of footing or terrain conditions.

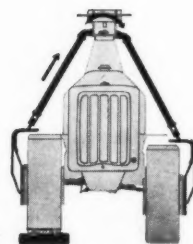


FOR FULL INFORMATION CALL YOUR CATERPILLAR TRACTOR CO. DEALER
• He is also your HYSTER Dealer •

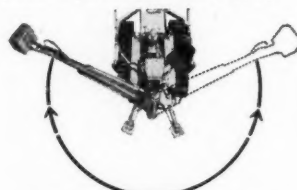
HYSTER COMPANY

2952 N.E. Clackamas Street, Portland 8, Oregon,
1852 N. Adams Street, Peoria 1, Illinois.
Portland, Oregon; Peoria, Illinois; Nijmegen, The Netherlands

For more facts, use Reader-Reply Card opposite page 18 and circle No. 345



FULL TRACK OSCILLATION. Equalizer arrangement provides true track-type tractor mobility to move about with ease over rough terrain. Equalizer can be locked to provide rigid machine while digging.



FULL SWING POWER is maintained through a 240 degree arc. Makes possible higher digging efficiency. Rack-and-gear type swing mechanism is fully protected and sealed in oil bath.

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Using Fleetweld 85 arc rod like that used for the stringer bead, workmen put a hot-pass bead on the line with Lincoln 250 units.

expected to be easier, since there will be more uniformity in both soil and trench depth.

Trenching is tough

One of the toughest assignments on the 140-mile contract was the excavation of the pipeline ditch in mountainous terrain, where granite rock was a big problem. Plans called generally for a 60-inch-deep ditch, which gave a minimum of 38 inches of cover over the pipe. But in some sections, the trench had to be 20 feet deep to allow the bending crew to work properly.

All tough excavation of this nature was done by three Bucyrus-Erie 22-B backhoes equipped with 3/4-yard backdigger buckets. A 22-B Bucyrus-Erie equipped with an Owen clam-shell bucket was also on the job to help a front-end shovel clam in padding material after the trench had been completed.

Rock and granite in many places required extensive drilling and shooting. To get plenty of air capacity at high altitudes, the company brought in two Chicago Pneumatic 600-cfm compressors and a Jaeger 600 machine. This compressor line worked with three twin sets of Chicago Pneumatic and Thor drills, which were carried on a standard tractor sideboom mounting.

Timken rock bits were used for all but the toughest drilling, when Timken tungsten-carbide insert-type bits were brought into play. A staggered hole pattern, covering both edges of the trench, was used. Hole spacing was on approximately 5-foot centers. By column-loading these holes with approximately two-thirds of a pound of powder per cubic yard of rock and exploding the shots with high-velocity Primacord, crews secured excellent fragmentation, and this allowed the 22-B's to work fast as they scooped up the loosened material and dumped it to one side. So tough and slow was this rock excavation that trenching and drilling were done around the clock to keep the work ahead of pipeline crews.

In soil formation where ditching was easier, a large Buckeye ditching machine was used. Equipped with H & L detachable teeth on its endless bucket chain, the rig often finished

(Continued on next page)

For more facts, circle No. 346→

Three Lincoln 300-amp welders, carried on a war surplus half-track-type rig, are used for the initial stringer bead on the line. These halftracks crawled quickly and effortlessly over the most difficult terrain.



Ride the new "660"

150 hp...8 forward
speeds...does more
work in less time!

The best way to judge a horse... or a car... or a grader, is to ride it. Get behind the wheel of a modern Adams "660" and see for yourself!

You'll find the big diesel engine starts readily in any kind of weather. Convenient and positive-acting power-controls raise, lower, revolve, or extend the 12-ft. blade to any desired position.

Pull the throttle and feel the surge of power. Set the blade for a deep cut, then watch the dirt boil over-and-out as the big tires take hold, and see how the machine hangs on to occasional over-loads. Note how Adams constant-mesh transmission provides easy gear shifting with no clash of spur gears.

Flexible speed range means more work per day

Eight forward speeds (1.4 to 25 mph) provide the necessary wide speed range to handle all operations at the fastest practical rate. Three addition-



Equipped with dozer-blade, Adams grader backfills, dozes trees and stumps, push-loads scrapers, moves debris off right-of-way, fills in around culverts, and does "handy-man" jobs usually assigned to special tools. With V-type snow-plow "660" can buck heavy drifts.



al "creeper speeds" (.23 to 1.82 mph) are optional. These "slow motion" speeds gear the grader to extra-low speeds—no need to slip the clutch. Make it easy to rip up rocky and rooty terrain with less shock to the grader. Creeper speeds are important, also, for accurate finishing in tight places. No other grader offers this wide range of eleven forward operating speeds. They mean more and better work done, in less time, also mean a big saving in downtime and maintenance.

4 Reverse speeds (1.8 to 13 mph)

This wide range of backing speeds saves time on every cycle. You can back at 13 mph for a second cut. Or you have a good range of working speeds for grading or mixing on the reverse part of the cycle. This reverse range provides extra safety, extra accuracy for maneuvering.



Operator on any Adams grader can move blade from ditch to bank-cutting position in less than a minute. Horizontally he can reach up to 7 1/2' outside the wheels. Blade is fully reversible...note high 28" clearance under front-axle for straddling high windrows.

Applying double-action hydraulic brakes to wheels also brakes transmission...gives greater safety in quick, sure stops, with less pedal action, less strain on machine.

Leaning front wheels balance the pull of the blade, give more accurate control on slopes, reduce stress, make steering easier, safer.

Engine rubber-mounted. No engine vibration is transmitted to grader to annoy and fatigue the operator. Means better operator satisfaction and efficiency.

See the "660" ADAMS before you buy any grader

Judge your next motor grader on the basis of performance. Ask your LeTourneau-Westinghouse Distributor to show you a "660" in action. Ride one of these machines. Find out for yourself why Adams motor graders do more work, in less time, at lowest cost.

A size ADAMS for every need

Model 660—150 hp diesel, 27,730 lbs. A big grader for big jobs—high production on construction work.

Model 550—123 hp diesel, 23,500 lbs. Heavy-duty, all-purpose machine, outworks anything in its class.

Model 440—104 hp diesel, 21,500 lbs. A good producer on all average grading and maintenance work.

Model 330—80 hp diesel, 20,500 lbs. A good general-purpose machine with surprising capacity.

Traveloader—high-speed, heavy-duty, self-propelled, belt-type loader. Loads trucks from windrows or stockpiles.

AG-3-G-6



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company



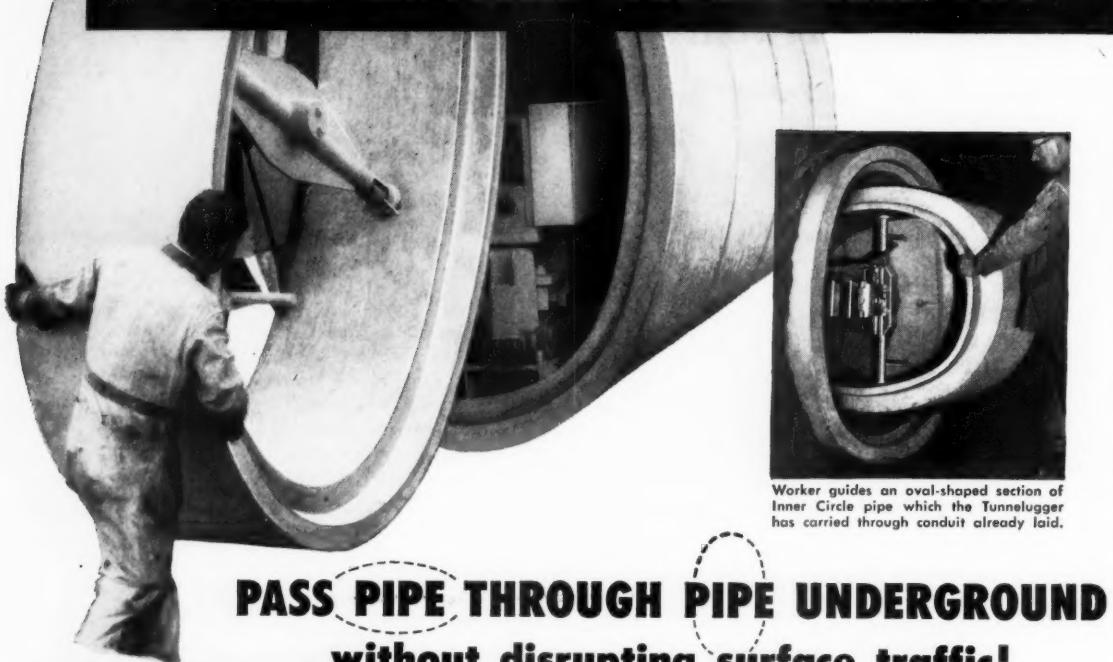
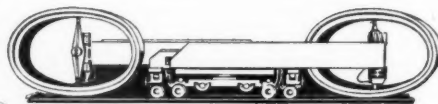
A Caterpillar tractor with Trackson side boom and Superior pipe tongs holds a section of pipe against another section while the welding crew prepares to spot weld the line together.



Following welding, the pipe is coated with asphalt paint and wrapped with Coromat underground pipe wrap and asphalt felt paper by a C-R-C pipe-coating machine driven by an International diesel.

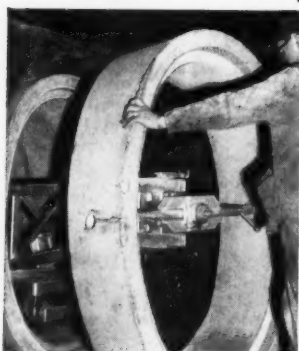


PRECAST REINFORCED CONCRETE TUNNEL PIPE



Worker guides an oval-shaped section of Inner Circle pipe which the Tunnellugger has carried through conduit already laid.

PASS PIPE THROUGH PIPE UNDERGROUND without disrupting surface traffic!



The Tunnellugger backs off with the pipe still on the arms to set it firmly in place, assuring an even, tight joint.

Inner Circles methods using elliptical Tunneliner pipe now make it possible to pass full structural ring, precast, concrete pipe through conduit already laid—even on curves. Surface excavation is eliminated...traffic is undisturbed...work progresses regardless of weather conditions. Less equipment and fewer laborers are required, yet sewers are completed faster at less cost, with pipe strengths *pretested* by commercial laboratory procedures.

The new two-way Tunnellugger can operate in either direction from a centrally located shaft—quickly delivering and positioning Inner Circles at either end while digging continues at the other.

Our technical staff will be pleased to assist you with your pipe problems.



AMERICAN-MARIETTA COMPANY CONCRETE PRODUCTS DIVISION

GENERAL OFFICES: AMERICAN-MARIETTA BUILDING, 101 EAST ONTARIO STREET, CHICAGO 11, ILLINOIS • PHONE WHITEHALL 4-5600

DIVISIONS AND SUBSIDIARIES

B. C. Concrete Company, Ltd.	Concrete Products Co. of America	Lewistown Pipe Company
Concrete Conduit Company	Lamar Pipe and Tile Company	Universal Concrete Pipe Co.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 347

(Continued from preceding page)

more than a mile of ditch per day. This machine is expected to be particularly efficient when work gets to the agricultural country in Weld County, Colo.

An unusual operation on this job was the auger boring required at places where the line intersected highways and railroad tracks. One bore for a railroad track was 180 feet in length. Continuous-flight sets of augers, driven by a diesel engine through a gear train, bored the necessary openings even through rocky embankment material. This auger boring and trenching was done simultaneously to make work move faster on the pipeline.

Pipe assembly is fast

Three supply companies fabricated and delivered the 22-inch steel pipeline joints to the job. These suppliers, Youngstown, Consolidated, and A. O. Smith Corp. of Milwaukee, delivered the pipe to railroad sidings at Laramie, Buford, Carr, Greeley, Ione, and other rail points along the route.

Pipe stringing was done by Parkhill Trucking Co., Tulsa, Okla., a specialist in that type of work. By laying the pipe sections out along the trench line with their ends raised off the ground by short timbers, the stringing crew greatly simplified and shortened the job of bevel-joint grinding before the sections were joined.

The Houston firm assembled pipe in such a way that 2-mile runs were commonplace. In the first step, the beveled joints were ground lightly by electric-powered grinding equipment that moved along the line just ahead of the jointing operation. A Caterpillar D6 with Trackson side boom placed the joints together. With the help of Superior pipe tongs, each section was picked up, its end butted against another section, and a rapid spot weld made to hold the pipe together.

Welding was done by three or four Lincoln 300-amp diesel-driven units, mounted together on halftrack-type vehicles purchased from World War II surplus. These machines easily crawled over even the most unfavorable terrain. Using Fleetweld 84 arc rod, the 300-amp machines put an initial

CONTRACTORS AND ENGINEERS

stringer bead on the joint, and Lincoln 250's, similarly mounted and using the same type of rod, followed with a hot-pass bead. Lincoln 200's were used on the filler and cap beads, so that each joint was completed in four passes. The pipeline welds were supported on timber cribbing so that the pipe stayed far enough off the ground to render the overhead portion of each weld easy.

Thompson was using 16 welding machines to weld the line in the mountainous country, but he hoped to get seven or eight more when operations reached the flat country, where even greater runs are expected.

As soon as welding was complete, equipment passed along the line rapidly, cleaning rust and mill scale from the sides of the pipe, priming the metal with a Bitumastic preparation, then wrapping the pipe.

The first machine in line was a C-R-C cleaning rig. Then a C-R-C pipe-coating machine powered by an International industrial diesel applied a heavy coating of asphalt paint and a double wrapping simultaneously to the pipe. The wrap consists of Coromat underground pipe wrap—a glass paper—and one layer of asphalt felt paper. Two C-R-C dope pots and one Littleford heating kettle helped to keep a supply of Bitumastic material on hand. A day's supply of paper and other materials moved along with this gang. The odd materials were carried by sleds drawn by an International TD-18A. The sleds were constructed with a low center of gravity so that they would not tip over, even on the steepest hillsides.

Lowering-in was a job for the bigger D8's and D7's, which were equipped with Trackson sidebooms. During this operation, the pipe was carefully cradled in heavy straps to prevent damage to the wrapping. This had previously been inspected by a Pipeline Inspections Co., Inc., electronic detector. Also, the trench was padded with 4 inches of sand or light gravel to prevent the wrapping from being damaged by sharp rocks. Six inches of the same material was also placed over the pipe.

THE END

Aggregate dryer

■ The Tarco Flash-Flame dryer, Model AD-7-PX, is the subject of a bulletin from the Tarrant Mfg. Co. A diagram points out the features of the dryer. The fact that almost any non-combustible material—gravel, sand, stone, slag, etc.—can be dried or heated by the unit is emphasized.

To obtain this bulletin write to Tarrant Mfg. Co., 27 Jumel Place, Saratoga Springs, N. Y., or use the Request Card at page 18. Circle No. 13.

LeTourneau-Westinghouse buys Reisser Corp. output

The latest addition to the line of earthmoving equipment marketed by LeTourneau-Westinghouse Co., Peoria, Ill., is the Reisser Elegrader. LeTourneau-Westinghouse has made an agreement with the Reisser Corp., Blair, Nebr., to purchase the entire output of the Reisser firm.

For more facts, circle No. 348→

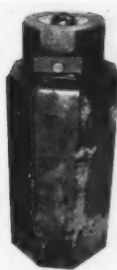
FEBRUARY, 1956

Octagonal drop ball is tough rock breaker

■ A forged steel drop ball offered by the Cape Ann Anchor & Forge Co. is said to incorporate long life and better wearing qualities for secondary breakage. The octagonal units are available in sizes from 2,000 to 12,000 pounds.

Forged at high heat from quality steel, these drop balls are stress-relieved and heat-treated to give maximum wear. According to the manufacturer, the octagonal shape provides greater impact per blow, thereby re-

ducing the number of drops required to produce a maximum amount of stone. A forged connecting link is adaptable for swivel or shackle. The



pin is of strong alloy steel.

The units are said to prove rugged, dependable breakers for use in quarries or on demolition jobs.

For further information write to the Cape Ann Anchor & Forge Co., Gloucester, Mass., or use the Request Card at page 18. Circle No. 80.

Clark Equipment appoints

W. F. Rowley has been named purchasing agent of the construction machinery division of the Clark Equipment Co., Benton Harbor, Mich. He had been an assistant purchasing agent.



How L.G. Arnold, Inc.



licks spongy haul road, 20% grades

On regrading 12½ miles of Wisconsin Highway 95, from Blair to Hixton, L. G. Arnold, Inc., of Eau Claire, Wis., found Tournapulls a big help in licking a tough hauling problem. Their job was to widen grade from 20' with 4' shoulders to 22' with 8' shoulders. It also involved raising the road 2 to 4 ft., including a 15" sand lift. The other material handled was clay and shale mixed and silty sand.

Three miles of this 612,000-yd. job lay in a swampy area where bubbling springs made road soft and spongy. 3 weeks of rain, after starting the job, made spongy conditions worse.

Equipment used on this project included 7 new C Tournapulls, 3 Super "C's", 6 crawler-scraper units, 10 crawlers for pushing and dozing, 1 roter, and 2 motor patrols.

7 loads per hour on 6000' cycle

On a long haul from borrow pit, over a typical 6000' cycle, each of six Tournapulls on this operation averaged 8.3 min. per trip, 7 trips per hr. Contractor estimated the 6 "C's" averaged 20,000 yds. in a 50 hr. wk. The soft haul road had a 20% grade from highway to borrow pit. Rigs traveled in 2nd gear most of haul distance.

3-mile one-way haul to build 15" sand lift

Later, the Tournapulls were used to haul the 15" sand lift on hauls rang-

ing up to 3 miles one way. On the long operation, rolling resistance on the sandy, clayed-loam road was as high as 250 to 300 lbs. per ton. "C's" were equipped with sideboards and 24:00 x 25 tires. These large tires, with 45 lbs. pressure, made it possible for rigs to go through spongy sections in the new grade, trip after trip, without damage to the soft sub-grade.

This time study was taken on the sand lift operation while the 7 "C's" worked a 5.2-mile cycle:

Time in Borrow Pit
(2000' from haul road) .. 6.7 min.
Travel 10,000 ft. @
16.2 mph avg. 7.0 min.
Travel 2,000 ft. @
8.0 mph avg. 2.9 min.
Return 11,000 ft. @
16.4 mph avg. 7.7 min.
Return 1,000 ft. @
8.0 mph avg. 1.4 min.
Total cycle time 25.7 min.
Each machine averaged 14 yds. per load. On this 5.2-mi. swing the 7 "C's" totaled 1900 yds. per 10-hr. day.

"Sure-footed in wet going"

Performance of the C Tournapulls was praised highly by the men on the job. Said Phil Dudenhofer, Grade Superintendent, "I like the sure-footedness of the C Tournapulls in wet and slippery going." On the grading operation, Ralph Ring, Master Me-

C Tournapull loads clay and shale for 3000-ft. haul to roadway seen in distance. Occasional slabs of shale made loading difficult. Avg. load time was 65 sec. over 90-100 ft.



Spongy, soft condition of roadway is shown. On the 12½-mile job, 9000 ft. of drainage pipe and 7 bridge structures will be installed.

Loading sand for sand lift, "C's" "float" over soft footing with big 24:00 x 25 tires.



chanic, said, "Tournapulls unloaded by themselves while other units had to be pushed to unload."

Commenting on the sand lift operation, Norman Hulett, Superintendent, had this to say: "Tournapull is the most sure-footed piece of equipment I've ever seen on rubber. I never figured I'd see rubber tires go where these can go."

You, too, need speed and versatility to meet your dirtmoving problems, on long hauls, short hauls, in bad weather, spongy footing, and other adverse conditions. Check Tournapulls for the answer. Write or phone your LeTourneau-Westinghouse Distributor for a demonstration on your job. He will be glad to show you how to get lowest-net-cost-per-yard with Tournapulls.

Tournapull—Trademark Reg. U.S. Pat. Off. P-905-H-b



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company



Cranes work from floating mounts to place deep seals for Wisconsin River bridge

Three special tremies help pour bridge piers . . .

As concrete is poured for the west pier, the 22-B holds the tremie up to the desired grade. The completed east pier, which was poured at night, can be seen in the background.

O&E Staff Photos

The dark swirling waters and unusual rock formations that make Wisconsin Dells, Wis., so attractive to tourists caused the toughest problems for the contractor constructing a new bridge across the Wisconsin River.

Started early in 1954, the bridge was completed in August, 1955, by the Herman H. Mass Construction Co., Inc., Algonquin, Ill., under a \$565,000 contract with the Wisconsin State Highway Commission. Total cost of the project, including approaches and a railroad underpass, is in the million-dollar range.

Traffic on U. S. 16 formerly crossed the river on the lower deck of a double-deck bridge, which carries the tracks of the Milwaukee railroad on the upper deck. The old bridge, which makes an almost perpendicular crossing of the river, is well suited to railroad transportation, but because of sharp turns to and from the highway, the crossing was dangerous for motorists. Every time a large truck or trailer turned on or off the bridge, all other traffic had to be stopped. Long delays were common while traffic was heavy.

The new bridge, a three-span cantilever girder structure, crosses the river at a 30-degree skew to make a nearly straight-line connection with Main Street in Wisconsin Dells on the east bank, where the highway underpasses the end of the railroad bridge. An easy curve on the west bank connects with the existing highway.

The bridge required two piers in addition to the abutments at the top of the high rock bank on each side.

Cofferdams in deep water

To build the two river piers, the contractor first made floating mounts for two cranes. The floats, made from army-surplus pontoons, measured 33 feet long, 6 feet wide, and 4 feet deep. Timber stringers were laid across the pontoons, and steel beams, laid in the other direction over the timbers, were fastened with steel clamps which went down between the pontoons and attached to other steel beams under the pontoons. This tied the deck into a rigid structure which distributed the weight of the cranes over the pontoons.

One of these floats, consisting of seven pontoons, carried a Bucyrus-Erie 22-B crane, and the other, made up of 10 pontoons, carried a Koehring 605 crane. A sea mule did double duty as a towboat to move floats from place to place, and as a work

America has homework to do!



THERE'S PROBABLY a lot about your town that makes you want to brag a bit about it.

But there's one thing you *can't* be proud of. And it's a shame you share with just about every other community in America.

The homes where far too many people live are a disgrace. Slums, semi-slums, housing blight are with you. Fixing them up is the homework to be done.

If your town is like most in the U. S., here's what the figures show: 1 out of every 10 homes are rock-bottom slums. Nearly one-half urgently need basic repairs.

But slums are something that is happening on the other side of town, you may say. The problem isn't mine.

Slums are YOUR homework

Distance is no barrier against the threat and cost of housing blight.

Your taxes go up because it takes more money for your town to fight the diseases and delinquency and poverty spawned in the slums. The security of your family goes down because the slum is the natural parent of crime.

Where your business comes in

Every firm has a responsibility toward the town where it's located. Part of it is to support community improvements as any other good citizen would.

Some slums are beyond repair. They must be torn

down and a fresh start made. Others can be made to conform to accepted living standards. So it is up to you to get behind every sound program which seeks to provide adequate housing for all our people.

Civic and individual groups must have business backing . . . your firm's backing if they are to succeed.

Follow the course of Action!

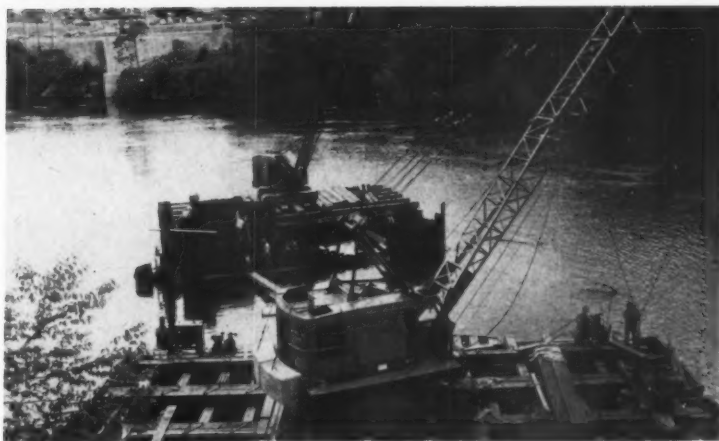
A group of Americans from every walk of life has joined together in a non-profit organization to combat home and community deterioration, A.C.T.I.O.N., the American Council To Improve Our Neighborhoods.

Send today for a free copy of "ACTION." It explains what A.C.T.I.O.N. is and proposes to do. It lists booklets, research, check-lists, and other material which can help you. Address P. O. Box 500, Radio City Station, New York 20, N. Y.



American Council To Improve Our Neighborhoods

Preparing for the tremie seal, the Koehring 605 crane, foreground, works from a float of timber and steel beams crisscrossing 10 pontoons. A Bucyrus-Erie 22-B works from a similar float in the background.



boat to move personnel and supplies to and from the floating rigs.

Since the piers are identical in practically every respect and since the time schedule permitted them to be built consecutively, the contractor constructed both piers with the same 50 x 20-foot cofferdam. First set up for the east pier, then removed and reset for the west pier, the cofferdam was braced by three frames of 12 and 14-inch bearing pile sections welded together. Spuds driven in the inside corners aligned the frames and held them in place.

The heavy sheet-piling sections were driven by McKiernan-Terry 9-B-3 and No. 7 hammers handled by the Koehring 605 crane. A 60-hp oil-burning boiler furnished steam for the hammers. To provide a good toehold piling was driven 40 feet through the water and into the underlying layer of hard sandstone.

When the sheathing had been driven, an air-lift was used to pump the sand out of the cofferdam, while the Koehring 605 crane with a Williams clamshell bucket removed the stones. These boulders were graduated in sizes all the way up to 1½ tons. All overburden was removed down to solid sandrock before the tremie seal was placed.

Make special tremies

A tremie seal of concrete ranging from 10 to 17 feet in depth had to be poured before the cofferdam could be unwatered. Mass made three special tremies for placing this seal, the vertical stem of each consisting of a tapered steel tube of 14 gage material. These tubes, 40 feet long and tapering from 10 inches in diameter at the top to 14 inches at the bottom, were reinforced on the outside by two 4 x 4-inch steel angles. These ran the full 40-foot length of the tubes and were welded on opposite sides. The angles also acted as rails to guide the tremies into place.

On the top of the tremie tube was a 1-cubic-yard hopper also made of steel. Attached to the side of the hopper was a wooden working platform with a railing for the men who operated the gates of the concrete buckets as the pour was being made. Each tremie was fitted with a valve to close the bottom of the tube. This valve or plug had a plywood liner to assure a snug fit in the end of the tremie. Four rods extended to the top of the tremie so the valve could be opened or closed from the working platform. This valve enabled the workmen to keep the tremie pipe full of concrete at all times.

At the water surface on the inside of the cofferdam, 12-inch I-beams set across the cofferdam at the middle and quarter points were securely welded to the steel sheathing. A guide pocket made up of angles was welded to the middle of each to form a guide for the tremies. Before the pour was started, the three tremies were set into these pockets so that

the ends of the tubes rested on the rock. Tremies were raised by a crane as the pour proceeded.

In preparation for a tremie pour, the Koehring 605 crane was anchored midway between the shore and the pier so that it could reach both, and the Bucyrus-Erie 22-B crane was moored beside the cofferdam. The

(Continued on next page)



Four-wheel drive, and tires 2' wide, give Tournatractor ample traction to make full use of its 208 hp.



Root-Rakes

Here's what high-speed on rubber can do for you

Tournatractor, with 19 mph forward speed and 8 mph reverse speed, can do many tractor jobs twice as fast as a crawler-tractor.

Drives anywhere

Because of its big low-pressure tires, Tournatractor drives anywhere under its own power. Job-to-job moves can be made across pavement, over curbs, sidewalks, and railroad tracks. On long moves it saves time, bother, and expense of locating a trailer, moving in extra manpower and transport equipment, loading and unloading.

Reduces maintenance

Tournatractor greatly reduces maintenance and service costs by eliminating some 500 wearing parts that grind through dirt in a crawler-track assembly. Eliminated also is the friction caused by grit-grinding in the track assembly which reduces rated horsepower.

Easy to operate

With simple easy-to-handle power controls, and comfortable, adjustable, foam-rubber seat, operator on

Tournatractor works comfortably, with less fatigue, maneuvers faster, gets more work done, in less time, with less effort.

High-speed performance

Constant-mesh transmission eliminates delays in changing gears... saves vital momentum... gives any gear-ratio instantly. As a pusher or dozer, Tournatractor high-speed reverse (up to 8 mph) is a very important time saver.

Versatility helps get more work done

Wide range of attachments increase Tournatractor range of applications, extend length of work season. Since Tournatractor is a "traveling man", these optional attachments are especially important in finding profitable jobs in a wide range of big or small industries and in any climate or area selected.

a. Equipped with Bulldozer or Angledozer blade, Tournatractor push-loads scrapers, moves short-haul dirt, cleans up at shovel, loads and spreads on dump, digs drainage ditches, maintains haul roads, clears land, terraces, digs

stock piles, grades roads. Does all these jobs fast.

b. Root-Rake makes 208 hp Tournatractor a powerful tool for clearing brush, grubbing roots, raking out boulders, etc. The 11'4" wide x 4'6" high rake has 10 teeth of 4" high-grade steel, to resist shock, do heavy work.

c. V-type snow plow mounts on same A-frame as dozer... clears 12'4" width, 6½' height. Can mean earnings for you during winter season when most earth-moving equipment is idle.

Find out for yourself how high-speed C Tournatractor can take over a major percentage of your tractor work, and save you money. Ask for owner-verified job reports on work similar to yours.



V-type snow plows

Tournatractor, Angledozer—Trademark Reg. U.S. Pat. Off. T-954-G-b



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For more facts, circle No. 350→

FEBRUARY, 1956



The tremie is swung into position by the Koehring 605. The platform at the side of the hopper is for the workmen who will handle the concrete during the pouring operation.



The Bucyrus-Erie and Koehring cranes work together here in holding the tremie in a vertical position. From here it can be lowered accurately into the guide prepared for it in the cofferdam.

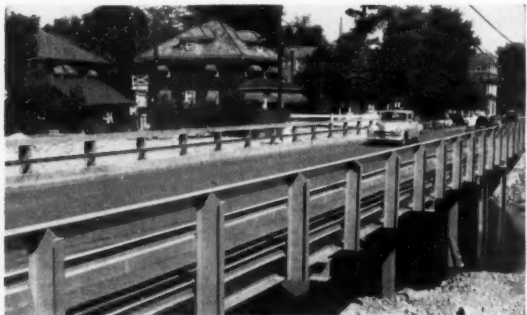


Bethlehem Formed Steel Bridge Flooring is installed on a temporary bridge on Route 402 in Monroe County.

Temporary Bridges in Flood-Torn Monroe County, Pa., Built with Formed-Steel Decks

As a result of last summer's devastating floods, Monroe County, Pa., was left with over 40 highway bridges knocked out. At 25 locations in the county, temporary bridges had to be quickly put up in order to connect vital traffic routes.

These temporary bridges were built with a general design of H-piles, pile-capping, stringers, and bridge deck. And on many of the bridges, the deck used was



Temporary bridge in Stroudsburg, Pa., built with Formed Steel Flooring.

Bethlehem's Formed Steel Bridge Flooring.

The advantages of using Formed Steel Bridge Flooring were many. First, it was quickly and easily installed. A simple A-frame derrick carried the plates from stockpile to bridge. Field welding secured both the flooring to stringers, and the adjacent plates together. After surfacing material was applied, the new bridges were smooth and rattle-proof, requiring little or no maintenance.

Even though the Monroe County bridges were built for temporary use, they are strong enough to meet local traffic load requirements. One reason for their strength is the formed steel decking, for Bethlehem Bridge Flooring meets all strength specifications of the American Association of State Highway Officials' standard specifications for highway bridges.

For complete information on bridge flooring, just phone or write the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

For more facts, use Reader-Reply Card opposite page 18 and circle No. 351



(Continued from preceding page)

Koehring crane picked the tremies from the shore and swung them out to the cofferdam. Then the two cranes joined forces to lower the tremies straight down the guides. As the 22-B held the tremies at the desired elevation, the 605 transferred concrete from ready-mix trucks on shore to the hopper of the tremie in two 1-yard Heltzel buckets.

Concrete was supplied by Wyocena Sand & Gravel Co., Inc., Portage, Wis., and delivered to the job in Rex transit mixers carried on International R-190 trucks. Using two buckets, the crane swung empties in from one side and then took full buckets away from the other side. On the return the swing was made from the opposite direction. A short chute, which could be swung from side to side, enabled the mixer to discharge into either bucket.

When the concrete had been poured through one tremie to the desired depth, it was set down into the concrete until it supported itself. The 22-B crane then picked up the next tremie, and the pour continued without delay. At the conclusion of the pour, all three tremies were removed from the cofferdam. A total of about 900 cubic yards of concrete was placed in the two tremie seals, more than half going into the east pier.

Bridge superstructure

The bridge piers consist essentially of two circular columns 8 feet in diameter at the bottom and 6 feet at the top, where they are spaced 26 feet apart and joined by a heavy concrete strut. Prefabricated wood and plywood forms were used for the columns. Concrete was placed with the same crane and buckets that were used for the tremie pours.

The superstructure of the bridge rests on two longitudinal steel plate girders which span 183 feet from the abutments to the piers and then cantilever out 61 feet from the piers to support the 122-foot suspended center span. The girders are haunched at the piers, tapering from a maximum depth of 15 feet over the piers to a minimum of 8 feet.

A system of floor beams and

CONTRACTORS AND ENGINEERS

stringers between the girders supports the 7-inch concrete floor. The floor forms for the deck were suspended from the beams with Universal wire beam saddles. The floor was made up of 2 x 6 joists and plywood sheathing. The roadway section is 30 feet wide, and sidewalks, 6 feet wide and enclosed by a steel railing, cantilever out from the main girders on both sides.

Concrete for all portions above water consisted of a 6-sack mix designed to produce strengths in excess of 4,000 psi. On the underwater pours, an additional 14 pounds of cement per sack, or 84 pounds per yard, were added. Bethlehem Steel Co., Bethlehem, Pa., supplied the 1,483,000 pounds of structural steel and 229,000 pounds of reinforcing steel in the structure.

Supervising the project for the Herman H. Mass Construction Co., Inc., was Blaine Heaton. H. H. Mass, owner of the firm, also spent considerable time on the job. Resident engineer for the Wisconsin State Highway Commission was Earl Ulrich. Engineer of construction for the Department is S. E. Hicks. State Highway Engineer is Emmons L. Roetigger.

THE END

Concrete channel slab

■ Design data giving safe loads for lightweight expanded shale concrete channel slabs for floor and roof construction is incorporated in a folder from Empire Building Material Co. Support details are illustrated, and floor finished for typical 6-inch and 8-inch Lite-Rock slabs is shown. Channel-slab dimensions, specifications, and job photos are included.

To obtain this folder write to Empire Building Material Co., N. E. 92nd and Halsey Sts., Portland, Oreg., or use the Request Card at page 18. Circle No. 22.

Tractor-shovel

■ A catalog from Service Supply Corp. describes the outstanding features and points out economies said to result from the use of the company's Lodover, a one-cubic-yard combination overhead and front-end shovel for use on the International T-9 and TD-9. Complete specifications and accessories are given.

To obtain Bulletin LO 200 write to Service Supply Corp., 20th and Erie Ave., Philadelphia 32, Pa., or use the Request Card at page 18. Circle No. 9.

Maintenance manual

■ The Wix Fleet Manual, published by Wix Corp., Gastonia, N. C., contains maintenance check lists, records for work performed, and handy reference to the mechanical condition of each truck, earthmover, stationary engine and other filter-equipped engines. Contents include a fleet control survey sheet, maintenance guide and record, and a where-to-purchase guide.

To obtain this manual write to the company, or use the Request Card at page 18. Circle No. 17.

Floating strainer improves dewatering efficiency

■ Promising to improve the efficiency of dewatering pumps is a new strainer that attaches to the suction hose and floats just below the surface where the water is cleanest. The Float-Dock strainer, made by Fol-Da-Tank Co., Box 361, Rock Island, Ill., is designed to keep abrasive sand and gravel from pump impellers, bearings and packing to eliminate many costly repairs and part replacements.

Briefly, the Float-Dock strainer device consists of two units—a float tank which permits the strainer to draft just below the surface where water is cleanest, and the strainer itself which may be quickly detached.



The Float-Dock strainer improves dewatering efficiency and increases the service life of pumps.

Float-Dock functions well in both deep or shallow water. It will draw even in a five-inch depth. The strainer is hinged to the float allowing the float to ride level at all times



48th Street Twin-Arch Bridge on Queen's Midtown Expressway; contractors: Gull Contracting Company, Inc. Inset: Herbert E. Smith, superintendent

Richmond Study Points Way To Concreting Economies

Although the various methods of form tying affect both the cost and quality of concrete form work, little has been published on this subject. The purpose of this Richmond study was to analyze the relative merits of the two methods principally used today for tying medium and heavy concrete forms—Tyscrus and Tilt Locks. The results of this analysis—as the following excerpted data shows—disclose that one of these methods has much to recommend it over the other. Richmond Screw Anchor Company makes both products, so there can be no question of bias in the presentation.

Comparative Analysis of Form-Tying Methods for Medium and Heavy Concrete Work*

3/4" TYSCRUS			1/2" TILT LOCK ASSEMBLY (1/4" outside rods)		
	\$.3061	\$.1731		\$.95	\$.1234
	\$.21	\$.0731		\$.74	\$.95
Items used for each tie, their cost and freight weight					
1—3/4 x 10" Tyscrus	\$.1731	.07 lbs.	1—3/4 x 10" Threaded Rod	\$.1234	.44 lbs.
2—3/4 x 15" Tylags @ .3061	.6122	4.1 lbs.	2—20" Outside Rods @ .95	1.90	6. lbs.
2—4 1/2 x 5 x 1/4" Flat Washers @ .21	.42	4 lbs.	2—5" dia. Clamps @ .74	1.48	4. lbs.
	\$1.2053	8.97 lbs.		\$3.5034	10.44 lbs.
Less 90% Credit on return of Working Parts	.9290		No return of Working Parts	0.00	
	\$.2763			\$3.5034	
Analysis of use cost, per tie, based on 20 re-uses of working parts					
Tyscrus	\$.1731		Threaded Rod	\$.1234	
1/20th Working Part Cost	.0052		1/20th Working Part Cost	.17	
	\$.1783			\$.2934	
Plus freight to the job on and return freight on	8.97 lbs., 8.1 lbs.		Plus one way freight on	10.44 lbs	
Steps involved in installation of each type					
No pre-assembly required			Must be preassembled by screwing inside rod into female ends of the outside rods, 20 turns for each end. Assembled rods are pushed through holes in both sides of the form. Clamps are slid on outside rods, up to the wales and then turned three turns each to lock in place.		
Flat Washer is placed on Tylag. Tylag inserted in hole in the form and screwed into coil of the Tyscrus 7 or 8 turns for each Tylag			Thread of Inside Rod concealed in end of Outside Rod. No way of checking to be sure how far it is threaded in.		
HANDLING 4.13 lbs. per tie			In stripping Clamps are unseated by backing off three turns then sliding off the rods. Using the clamp as a wrench the outside rods are then turned out of the holes.		
Thread of Tylag visible beyond coil assuring full strength			HANDLING 9.81 lbs. per tie		
In stripping Tylag is backed out of each side of the form.					

*Facts shown here based on 12" wall, safe load of ties 9,000 lbs.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 352

regardless of hose weight or inclination.

Fabricated of heavy, cadmium-plated steel with a heavy brass hose coupling, the device is furnished in stock coupling sizes of 2 1/2, 4, and 4 1/2 inches (N. S. threads). The manufacturer can furnish any size or any thread upon special order.

For further information write to the company, or use the Request Card at page 18. Circle No. 139.

Symons appointment

George P. Cunningham has been appointed manager of advertising and public relations for the Symons Clamp & Mfg. Co., Chicago, Ill. He succeeds James Norris, now a sales representative.

Equally important are three additional facts which the analysis, by its nature, does not bring out:

- 1) The actual mechanical operation of putting a Tilt Lock Assembly together is much more time-consuming than is the Tyscrus operation.
- 2) There is only one threaded connection with the Tyscrus. The thread is coarse and the Tylag thread, being buried in the concrete, is self-cleaning when it is removed. The outside threads on the Tilt Lock Rods are subject to becoming scoured up by spillage of concrete and require cleaning.
- 3) The Tyscrus System can be readily equipped with Tycones as spreaders, if desired, which cannot readily be done with a Tilt Lock System.

By the nature of the Tyscrus operation, Richmond Tyscrus produce more accurate form work. Tyscrus Systems are planned for individual jobs and special requirements are on hand at the job as required. The threaded rods, when produced on the job, often are not available as needed and are costly to produce. When ordered from the manufacturer, they usually are furnished as fill-ins and so often do not fit the needs of the job and run up the cost.

CONCLUSION: The Richmond Tyscrus System effects great savings, in time, labor and cost, over the Tilt Lock System.

On all your medium and heavy construction work, Richmond Tyscrus will also give you extra strength. The published ultimate strength of the Tyscrus described above is 16,000 lbs., that of the Tilt Lock Assembly 12,000 lbs.—both are sold for 9000 lbs. safe-load. Furthermore, repeated impartial tests on all sizes of Tyscrus show that their ultimate strength far exceeds their published safe load. You can pour fast and heavy in all weather with these resistance-welded ties because they have extra strength built in.

Complete information on Richmond's Tyscrus Systems is contained in the 1955 catalogue of Richmond-engineered Tying Devices.

Write for your copy. If you have any specific problems, Richmond's Technical Division or field service men will be glad to submit recommendations, drawings and proposals. Write: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N. Y. or 315 South Fourth St., Saint Joseph, Mo.





PAVING BREAKER is one of a line of imported pneumatic tools for roadbuilding and other construction work. Now available in this country from Veral Corp., of Los Angeles, the German-made Krupp line also includes clay spades, concrete vibrators, rock drills, riveters and rammers, and concrete chipping hammers. For further information write to Veral Corp., 8637 Sunset Blvd., Los Angeles 46, Calif., or use the Request Card at page 18. Circle No. 131.

**This hoist is the most efficient
lightest, safest hoist in its
capacity class available today!**

The Coffing Super Power



It's an exclusive Coffing-designed coil chain hoist using patented, compound hardened alloy steel levers instead of bulky, heavy gears. It's more efficient (85%), more compact, with the greatest power-to-weight ratio and the highest safety factor (5) of any ratchet lever hoist yet invented. Available in 6 models from $\frac{3}{4}$ to 5 ton capacities. Model RG coil chain hoist available in $\frac{3}{4}$ ton.

"Safety valve handle" bends at point of maximum safe overload—may be adjusted for length and operated from either side of the hoist—can't spin out of control should operator's hand slip from handle. Every hoist must withstand the shock of its capacity load dropped in increments of 1" thru 4", an impact load of well over 5 to 1. Ask your Coffing distributor for literature or write for bulletin SP, Coffing Hoist Division, Duff-Norton Co., 810 Walter Street, Danville, Ill.

COFFING HOISTS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 353

Pile-driving for apartment job keeps to efficient schedule

**Delivery of steel sheet piling and steel pipe piles
eliminates need for storage at crowded work site**

Lima cranes with 70-foot leads work in a small area as they drive pipe piling for foundation of a 29-story apartment project on Chicago's Lake Shore Drive. Pipe and steel sheet piling was delivered by L. B. Foster on a well-timed schedule.

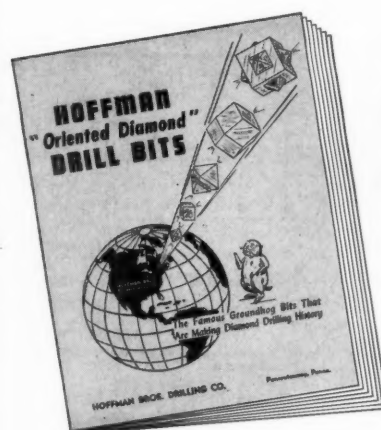


The congested residential area along the Lake Shore Drive near Chicago's North Side might have made excavation work for two 29-story apartment buildings more difficult than it actually was if city police and the material supplier had not cooperated as well as they did.

When work was started by Sumner

Collitt Co., Chicago, Ill., general contractor for the excavation for the buildings at 900 Lake Shore Drive, police helped ease congestion in the area by regulating heavy traffic on all four bounding streets whenever material was being delivered.

L. B. Foster Co., supplying the tons of steel sheet piling and pipe piling



Find Out How HOFFMAN BITS Save You Money

Send for a copy of
HOFFMAN'S new
"Oriented Diamond"
Drill Bit Catalogue

See how Hoffman Research is producing many other, almost unbelievable advancements in bit design like the Tapered "Step Core" and Miniature Bits shown here. The new Miniature Bits are reducing prospecting labor and costs because they operate from light, $\frac{1}{4}$ h.p. rigs. By combining drilling and reaming into one operation, the "Step Core" Bits penetrate faster—simplify core recovery—have high speed water release. Yes, it will pay you to find out why so many other drillers are getting better cores, lower footage costs and faster penetration with Hoffman "Oriented Diamond" Bits.



Hoffman Drilling Crews are also available for fast, efficient service on Contract Drilling Jobs.

HOFFMAN BROS. DRILLING CO.
BOX 426, PUNXSUTAWNEY, PA.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 354

CONTRACTORS AND ENGINEERS

for the building foundation, also made things easier for the contractor by scheduling deliveries so that storage did not become a problem at any time.

Altogether, 300 tons of steel sheet piling was rented from Foster. The 25 to 35-foot lengths were delivered in 100-piece loads every seven to ten days.

As soon as piling was delivered, it was driven by two Lima cranes working with air hammers in 70-foot leads.

The steel pipe piling and oak piles used in the foundation were also delivered in small quantities. A total of 1,200 steel piles, 65 feet long and

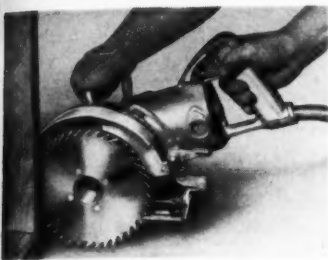
10 3/4 inches in diameter, was driven by Lake States Engineering Corp., Chicago. These were sealed with flat steel plates, and the pipes filled with concrete.

Today, the close scheduling of piling delivery is paying off. Foundation work is virtually complete for the \$11 million project. By this fall, the two adjacent buildings, containing 533 apartments or 2,358 rooms, will be ready for occupancy.

The builders and developers are Herbert S. Greenwald and Samuel N. Katzin. Ludwig Mies van der Roche is the architect, with Friedman, Alschuler, & Sincere as associate architects.

THE END

Power blade eliminates many hand-sawing jobs



A circular saw blade, fitting the No. 77 SkilSaw, has been designed to eliminate the need for hand sawing on many jobs requiring flush cutting.

The Model 7 Barnes blade, manufactured by The Barnes Blade Co., 16249 Colorado Ave., Paramount, Calif., can be installed in a SkilSaw—along with a special guard—in about a minute. It is designed to easily flush cut door plates, cut into a wall or cut out a section of flooring.

The 7 1/4-inch blade is made of nickel-chrome Moly steel with No. 40 combination deep gullet fast cutting teeth.

For further information, write to the manufacturer, or use the Request Card that is bound in at page 18. Circle No. 103.

Bulletin on shovel

A bulletin from Unit Crane & Shovel Corp. describes the outstanding features of the Model 510 3/4-yard shovel. Discussed are the hydraulic-actuated clutch control, full-floating trunion-mounted taper drums, self-aligning hook shoes, and force-feed lubrication.

To obtain this bulletin write to Unit Crane & Shovel Corp., 6411 W. Burnham St., Milwaukee 14, Wis., or

use the Request Card at page 18. Circle No. 46.

Prestressing, Inc., expands

Prestressing Research & Development Inc., San Antonio, Texas, has expanded its staff to accommodate an increased volume of work. A wholly-owned subsidiary of Texstar Corp., San Antonio, Prestressing specializes in offering professional consulting services on prestressed concrete.

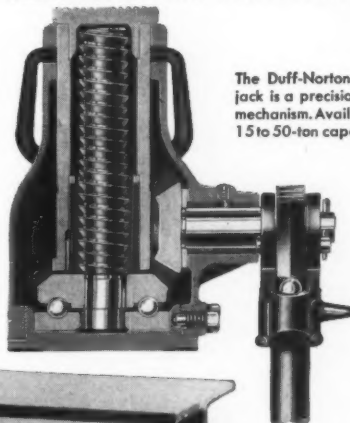


THE SMITH flame-gun, which provides 2,000 degrees of controlled heat, can be used to destroy brush, weeds and rubbish on land-clearing jobs. Weighing only 17 pounds, the unit burns kerosene, range oil, or light furnace oil. Tank capacity is 4 gallons. For further information write to D. B. Smith & Co., Smith Bldg., Main St., Utica 2, N. Y., or use the Request Card at page 18. Circle No. 129.

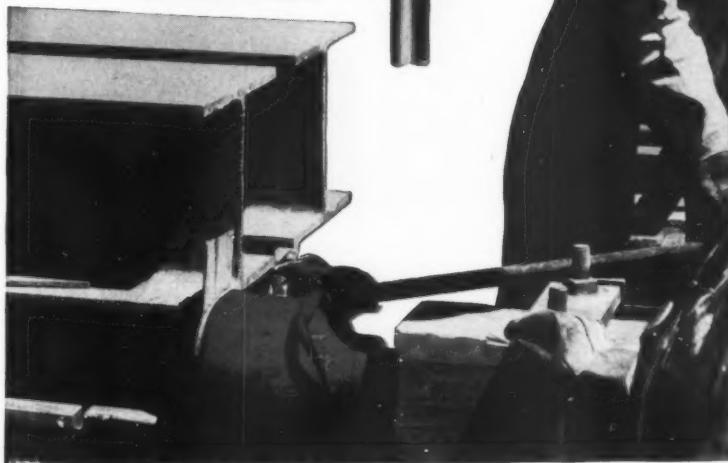
Duff-Norton

**Ball Bearing Screw Jacks
can't creep or drop—
will hold loads indefinitely**

Standard of the world for over 70 years



The Duff-Norton screw jack is a precision built mechanism. Available in 1 1/2 to 50-ton capacities.



Can be used upright or on side with equal efficiency—no fluids to leak, no air to "lock."

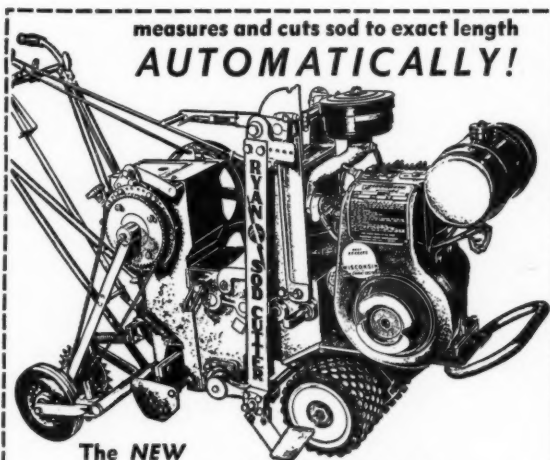
Duff-Norton Ball Bearing Screw Jacks, employing the basic inverted nut and screw principle, are locked in position when under tension, can't move up or down unless you insert the jack handle and apply hand power to ball bearing actuated gears in base that turn the nut. They are safe, foolproof, dependable, fully enclosed, rugged—seldom need lubrication or servicing.

For complete specifications on various capacities and name of your nearest recognized distributor, write the world's oldest and largest manufacturer of lifting jacks, the Duff-Norton Co., P. O. Box 1889, Pittsburgh 30, Pa. Ask for bulletin AD-12-S.

DUFF-NORTON

"Giving Industry A Lift Since 1883"

For more facts, use Reader-Reply Card opposite page 18 and circle No. 356



The NEW

**Auto-Cut-Off Model
POWER SOD CUTTER**

cuts 15 sq. yds. of sod per minute
(and cross cuts in the same operation!)

Here is, beyond doubt, the finest sod cutter ever built. The new Auto-Cut-Off model completely eliminates hand cross-cutting, gives you better quality sod with precision, square-cut ends for easier laying—greater profits. Easily cuts 15 sq. yds. a minute. Available in several sizes. For complete information, write Dept. K-1.

Ryan landscaping
Quality Built
Division of
KIM Machine Works, Inc.

871 Edgerton St.
St. Paul 1, Minn.

equipment company

For more facts, use Reader-Reply Card opposite page 18 and circle No. 355

Working from a ledge near the abutment for the southern land pier, a P&H crane with a 3,300-pound drop hammer drives 25-foot H-piles for the pier.

C&E Staff Photos

COST LESS!



White vibrators cost less to buy, cost less to maintain HERE'S WHY:

... completely interchangeable drives and heads, no special couplings required, less spares needed for maintenance.

... heavier eccentric rotors in vibrator heads for better performance in concrete.

... power units, either gasoline engine or electric motor, interchangeable.

... vibrator heads, from 1 1/4" to 3", and grinding heads interchangeable.

... replacement drive shafts cost less.

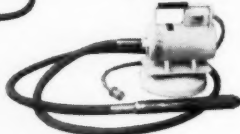
White MANUFACTURING COMPANY

ELKHART 9, INDIANA



MODEL ME-13, with 2 1/2 HP electric motor 110 V. AC or DC.

MODEL M-9 with 2 HP Lauson engine, automatic clutch.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 357

If you want time saving **MANEUVERABILITY** ... you want a **MILLER!**



Miller "BT" 10 ton Tandem axle \$1,635.00* F.O.B. Milwaukee Any optional equipment extra *Plus Freight and 8% Federal Tax

2 minute loading cuts time between jobs!

You can spot equipment with the ease of a hipless snake when you're backing a MILLER trailer. One man (a dump truck operator) can tilt, simply drive the equipment onto the broad oak decked platform ... be on his way in less than two minutes. You cut between-job time losses on men and machines ... boost productive time on every job! Many contractors also find MILLER Tilt-Top's one man equipment shuttling can often save duplicating expensive equipment on different job locations.

And Miller trailers are available in a variety of single or tandem axle Tilt-Tops, or low beds, to carry dozers, shovels, trenchers, rollers and other heavy equipment. All are built for the "long haul" — with MILLER'S massive "EDG-SUPPORT" frames, Timken roller axle bearings and 2" oak deck platforms.

Best of all ... you pay no premium for quality — no comparable trailer undersells a MILLER! See these production boosters at your MILLER distributor today — and compare!



Miller Model "D" 4 ton Low Bed \$395.00* F.O.B. Milwaukee Any optional equipment extra *Plus Freight and 8% Federal Tax

See your MILLER distributor or write for FREE literature to:

Miller
Tilt-Top Trailer Co.

456 S. 92nd Street, Milwaukee, Wis.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 358

✓ built best
✓ priced best



Concrete slabs are laid for bridge abutment riprap

Necessity played a part in the use of 5-inch-thick reinforced-concrete slabs for erosion protection at abutments of the Tarheel Bridge, now nearing completion across the Cape Fear River near Tarheel, N. C.

Because of a lack of suitable stone for riprap in this section of the state, the North Carolina State Highway and Public Works Commission turned to the use of the slabs to protect the four abutments of the \$575,000 project. A little more than a mile long,

the facility consists of a 300-foot overflow bridge and a 300-foot 6-inch fixed open span with 23 interior approach bents. By spring, the bridge will be opened, eliminating the little two-car ferry that now provides the only means of crossing the river between Fayetteville and Elizabethtown and connecting State Routes 87 and 53.

The project is being handled by two contractors. Grannis & Sloan, Fayetteville, N. C., the roadway con-

TARCO BARREL HEATER



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EASY LOADING
LOW COST HEATING
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NO TRANSFERRING MATERIAL
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WARMS SIDE or END OPENING BARRELS

HEAT MATERIALS IN THE SHIPPING DRUM ... RIGHT ON THE JOB!

Makes cold weather pouring, spraying or patching with asphaltic liquids practical. Don't delay important work because of cold weather or distance to the job! Ask your dealer, or write for complete details.

SAVES TIME • MONEY • MATERIALS



TARRANT MFG. CO.

31 JUMEL PLACE, SARATOGA SPRINGS, N. Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 359

CONTRACTORS AND ENGINEERS

Wire-reinforced concrete, 5 inches thick, gives erosion protection to earth fills on an overflow structure and a main river span

tractor, began excavation and fill work in October, 1954, getting a good start on a 200,000-cubic-yard fill assignment and on bringing the roadway up to grade at the end abutments to facilitate work on the bridge. The Bowers Construction Co., Inc., Raleigh, N. C., the structure contractor, moved in about a month later.

Riprap construction

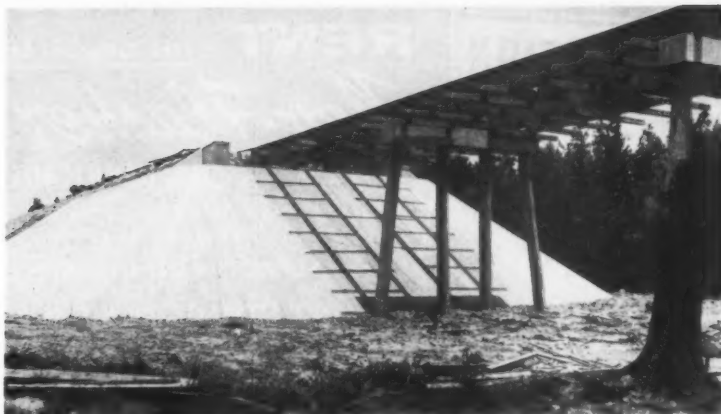
Abutment compaction was done with hand rollers before forms for the concrete riprap slabs were placed. Formwork of 2 x 6-inch lumber, running from the toe to the top of abutment fills, was then placed upright at 4 to 5-foot intervals. The wire-mesh reinforcing for the 5-inch slabs was positioned prior to pouring operations.

Riprap concrete with a slump of 3/4 inches was supplied from a batch plant set up near the center of the project. Batches were dumped into 2-cubic-yard transit mixers and hauled to the forms by a P&H crane. Concrete was poured in alternate widths and no consolidation was necessary. The mix consisted of: cement, 94 pounds; sand, 184 pounds; gravel, 348 pounds. The maximum water per bag of cement was 5.8 gallons.

The abutment on the south shore was riprapped back a distance of 20 feet on each side. The north abutment was riprapped for 60 feet on the

upstream side because of excess wash, and 20 feet on the other. Riprap was also placed on both abutments of the overflow bridge, located about 1,750 feet north of the north abutment. Earth fill was used between the two, eliminating the need for expensive piers.

(Concluded on next page)



The wire-reinforced concrete riprap slab for a bridge abutment shows how pours were made in 4 to 5-foot widths. Alternate strips were poured first, then intermediate widths were poured without the use of forms.

TDA® BRAKES

if it moves...we can stop it



New lightweight . . .

Fabricated steel brake shoes weigh many pounds less than cast shoes. Binding or freezing up is eliminated because double web construction permits limited area fit with one piece cam rollers. Wear areas of the webs are heat treated for long life.

Unit-mounted . . .

All brake parts are mounted on the spider for compactness. Efficiency is higher and correct cam shaft alignment is assured with close coupled cam shaft and chamber bracket.*

"P" SERIES POWER BRAKES

designed for heavy-duty service

Here is a brake that gives longer, trouble-free service for trucks, trailers, and all types of industrial and road equipment. These heavy-duty "P" Series Brakes are easy to maintain in service. Simplicity of design is the keynote—with brake, air chamber, and cam shaft all mounted as a unit.

The outstanding features of the Timken-Detroit® "P" Series Brakes give increased economy and performance. Operating temperatures are lower and lining life longer because open-type spiders assure good internal ventilation and rapid cooling. Timken® "Econo-liners" are tapered to provide greatest thickness where greatest wear occurs.

A constant-lift "S" type cam assures uniform application of brake shoes for maximum control and immediate response. Brake adjustments are quick with easily accessible slack-adjusters. Once the adjustment

is made, a lock automatically engages the adjusting screw to prevent its moving during service. Long wearing nylon bushings assure smooth operation with minimum maintenance.

"P" Series Power Brakes are available in a complete range of capacities and sizes to fit every operating requirement.

For additional information . . . with expert consultation, contact Timken-Detroit Brake Division. Complete specifications and information on the "P" Series Brake are available. And a staff of experienced engineers is ready to assist you with any problem you may encounter.

*"P" Series Brakes are also available with inboard chamber mounting for special applications.

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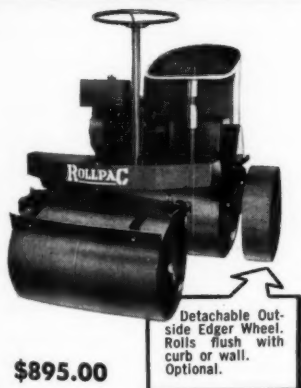


For every industrial, agricultural or automotive application where braking is required!

TDA plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York
Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

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SOIL-AIRE
ROLLPAC
Ruggedly built for heavy-duty service



\$895.00

A Standout Popular-Priced
One Ton Roller. Send for
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ROLCOR Industries

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Sold by over 95 distributors in United States and Canada

For more facts, circle No. 260

FEBRUARY, 1956



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FOR NO MORE THAN THE COST OF
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OUR SERVICE IS DEPENDABLE!

- NO STORAGE PROBLEMS •
- NO BARRICADES TO BUILD • NO CAPITAL INVESTMENT
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FRANCHISES AVAILABLE . . . Check the possibilities

NEO-FLASHER MANUFACTURING COMPANY

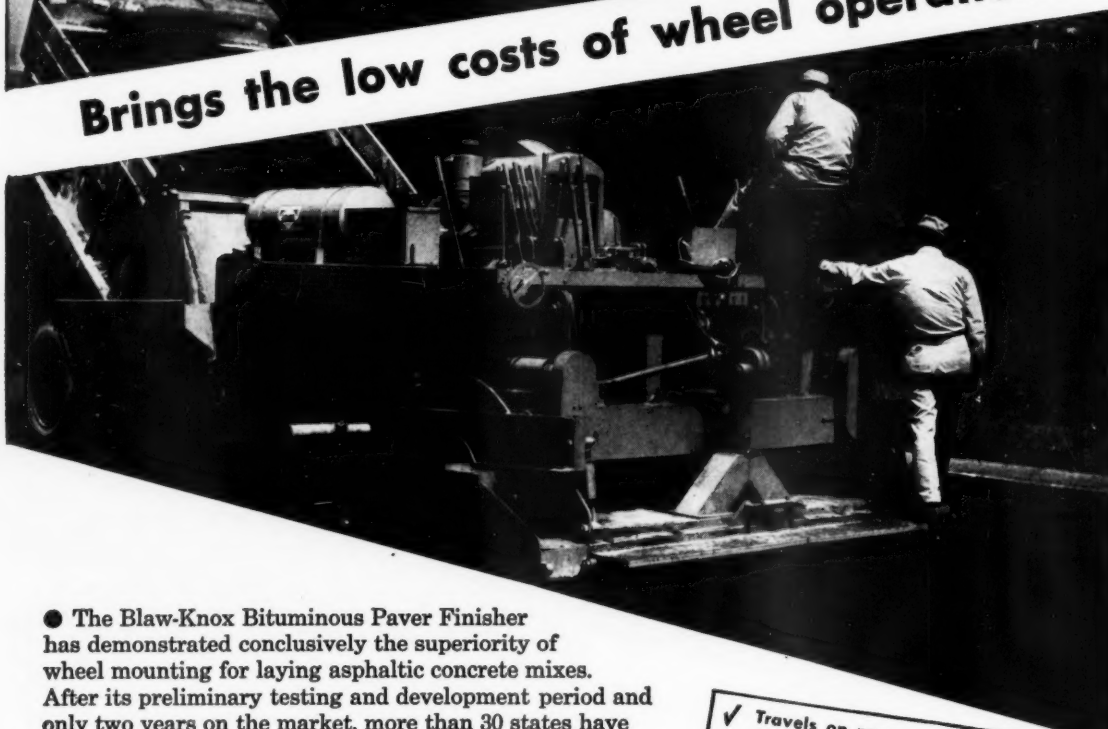
3310 Vahalla Drive, Burbank, California

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THE Bituminous Paver

Blaw-Knox

Brings the low costs of wheel operation



● The Blaw-Knox Bituminous Paver Finisher has demonstrated conclusively the superiority of wheel mounting for laying asphaltic concrete mixes. After its preliminary testing and development period and only two years on the market, more than 30 states have approved it for state highway work. Month by month the list continues to grow and with it the number of contractors who are getting a better surface at higher speed and lower cost.

Rubber tire mounting definitely reduces the time required for returning the machine for restarts. Long wheelbase and accuracy of steering, possible only with wheels, produce a smooth ripple-free surface under the straight edge and even control on curves.

No other machine can match the speed and perfect results of Blaw-Knox PF-90. See your nearest Blaw-Knox distributor for complete details.

- ✓ Travels on pneumatic tires with ease and speed.
- ✓ Long wheel base and wheel steering assure greater accuracy and smoother course.
- ✓ Eliminates the 500 to 600 parts characteristic of crawlers.
- ✓ Tires absorb vibration, reduce chatter in screed and reduce wear and tear on machine.
- ✓ Handles boxcar trucks on grades with ease.
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- ✓ Simple, easy crown adjustment.
- ✓ Dual controls—operate machine from either side.
- ✓ Compacts to uniform density and automatically measures and levels.
- ✓ Conversion for increased width is easy and fast.
- ✓ Works close to curb.

BLAW-KNOX COMPANY

Construction Equipment Division
MATTOON, ILLINOIS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 363

(Continued from preceding page)

After 24 hours, the 2×6 side forms were removed, and the remaining intermediate widths were poured to complete the abutments. The concrete was so dense that no additional formwork was required on intermediate pours.

The new abutments have an elevation of plus 55 feet. Though the maximum high water previously recorded—66½ feet in 1945—would have completely covered them, the Public Works Commission feels that the 55-foot elevation of the river span and overflow structure offers enough protection against high water.

Approach spans

The approach spans for the main

river crossing are carried on elevations of reinforced-concrete, 60 feet apart, and twelve 4-pile bents of 20-inch octagonal, reinforced, precast-concrete piles ranging from 45 to 57 feet in length. These bents are 45 feet apart.

All bent caps were cast in place with the same procedure used for riprap pours. Bent caps for the two main piers on opposite shores measures 5×3 feet and are 38½ feet long. The remaining caps, whether on piles or reinforced-concrete piers, measure 3×2½ feet deep and are 26 feet long. The concrete mix for the caps was made with air-entraining cement, used at a rate of ¾ ounce per sack of cement.

The biggest difficulty in pier construction was encountered at the south river pier, where foundation material did not go to the expected depth. Though the other ten piers required only timber piling to reach a suitable foundation, Bowers was forced to drive 12-inch steel H-piles to a 30-ton bearing under this pier. A 3,300-pound drop hammer, with a drop of 15 feet, was handled by a P&H crane to complete this job. The pier footing consists of two concrete pads, 22×20 feet and 4½ feet thick tied together with a smaller but taller concrete core. The 25-foot-long piles were driven their full length, and the piers required a total of 111—52 under one footing pad and 59 under the other.

The 20-inch octagonal piles were driven approximately 20 feet to a 36-ton bearing by a Vulcan 0 hammer handled by a P&H crane. The minimum bearing allowed was 36 tons, but some piles reached more than 100 tons capacity.

Superstructure

Four steel stringers support the approach-span decking. These, 36-inch I-beams on the 45-foot spans, and 33-inch I-beams on the 60-foot spans, were set in place by a Lima and a P&H 50-ton crane. The main 300-foot river span, of riveted construction, was erected from barges by cranes.

River-span decking consists of a 3-inch steel grid floor completely enclosed by ¾-inch-thick concrete slab that provides a ¼-inch wearing surface. Ready-mix trucks supplied concrete to Gar-Bro ¼-cubic-yard gas-propelled, three-wheel buggies, which poured the 26-foot curb-to-curb deck. The approach roadway is 24 feet wide.

Present contracts do not call for paving, but roadways will be finished with a 6-inch soil-type base course for stabilization.

Personnel

R. L. Wicker is resident engineer for the sixth division of the North Carolina State Highway and Public Works Commission, which has L. E. Whitfield as division engineer. Marvin Councilman is the superintendent for the roadway contractor, Grannis & Sloan. W. S. Baker is the superintendent for Bowers Construction Co., Inc.

THE END

CONTRACTORS AND ENGINEERS

Road builders anticipate adequate legislative aid

Highway financing is theme of ARBA's 54th annual meeting; plans are furthered for Road Show at Chicago in 1957

Keenly aware of the need and importance of a new federal highway bill, the American Road Builders' Association gave over a major portion of its 54th annual convention to a discussion of pending legislation in the current session of Congress.

Meeting January 11 to 14 in the Municipal Auditorium at Miami Beach, Fla., some 1,135 delegates heard members of Congress voice optimism that an adequately financed highway bill would soon be enacted into law.

Rep. George Fallon (D., Md.), chairman of the House subcommittee on roads, told the convention he was planning to introduce a new highway bill calling for a \$34 billion road program over a 12-year period. During each of these years, \$25 million would be added to a \$750 million basic federal highway program. The total would be approximately \$10 billion. In addition, \$24 billion would be provided and earmarked for the interstate road system. The \$750 million basic appropriation would be for primary, secondary, and urban highways only. Under this program, states would put up 50 per cent of any construction costs, as would the federal government. This is the system currently in use.

But the \$24 billion for the interstate system, to be spent at the rate of \$2 billion a year, would be raised on a 90-10 basis, with the federal government putting up the larger share. If the Fallon bill gets by the House, a Senate-House conference committee is expected to combine it with the Gore bill, which has already passed the Senate.

Congressional spokesmen

Sen. Davis Chavez (D., N. Mex.), praised the Senate-passed bill as an outstanding piece of work. He declared that the Senate felt the interstate system should be accelerated because of its value in serving interstate commerce and national defense.

Rep. J. Harry McGregor (R., Ohio) stressed the urgency of a multi-billion-dollar road program, pointing out that last year 8 million vehicles were manufactured, and that 4½ million more are expected to be produced in the current 6-month period. Turning to traffic accidents, the Ohio congressman reminded the group that 38,500 lives were lost last year in traffic accidents, and he called the recent "Christmas holiday slaughter a nightmare."

California papers—don't copy

The Miami Beach Chamber of Commerce was embarrassed no end during the January 11 to 14 ARBA convention. Temperatures that week were never far above the freezing mark in the worst cold spell Florida has experienced in 16 years. At the first general session, a bad cold kept Mayor D. Lee Powell from welcoming the shivering delegates huddled together in unheated Municipal Auditorium. They were greeted instead by former mayor Harold Shapiro, bundled up in a heavy coat sweater beneath his sport jacket. Opening day speaker Senator Dennis Chavez (N. Mex.) helpfully suggested running a natural gas pipeline from New Mexico to Florida to supply heat. Florida's Governor LeRoy Collins also had to pass up his scheduled welcoming speech. He was visiting (pardon the word) in California.

ANNOUNCING

PNEUMATIC PAVING

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veral
CORPORATION

BREAKERS

NEW CUSHION VALVE DESIGN

Front head replacement eliminated with replaceable moil point bushings of highest quality steel for longer life. Optional 1¼" or 1½".

Available with short front head for use with chain retainer.

Write today for full information and illustrated literature.



OTHER KRUPP PNEUMATIC TOOLS AVAILABLE

- Drills
- Grinders
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- Scalers
- Holder-ons
- Rivet Busters
- Sand Rammers
- Chipping Hammers
- Core Knockout Hammers
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(Continued from preceding page)

"There is no valid excuse in a nation as advanced as ours for such preventable loss in human life", McGregor went on. "Where inadequate highways are at fault, they must be expanded or rebuilt to safer standards. Other stern measures must be taken. How can we do otherwise?"

McGregor declared that he was opposed to earmarking the yield from present automotive excise taxes for highway purposes. He favored, instead, additional taxes on highway users to finance an expanded highway program.

Such additional taxes were also suggested by Sen. Francis R. Case (R., S. Dak.), who proposed that a \$6 sticker be required for each motor vehicle in the country. The stickers



John R. Robertson, Director of Highways for the District of Columbia, took over as president of the ARBA for another term at the Florida convention.

or stamps would be issued by the federal government. Case estimated that this tax could raise \$400 million a year. He felt, however, that such revenue should be distinctly earmarked for the interstate highway system, provided that Congress approve the interstate program.

Although opposition to the highway bill last year was generally believed to be sparked by the trucking industry, that industry wants the road program this year, according to John V. Lawrence, managing director of American Trucking Associations, Washington, D. C. He accused the railroads of "working behind the scenes, around the clock, either to block the road program, pare it down, or to make their competitors pay for it through the nose". Lawrence

claimed that the trucking industry is completely willing to pay its share of an expanded highway program, provided that the rate of taxation be the same for all classes of highway users. With reference to fuel taxes, the truckers' spokesman charged inequities in that a truck operator pays a one-gallon tax for 3½ miles of travel, while a passenger operator pays a one-gallon tax for 16½ miles of travel. Thus, Lawrence reasoned, the truck tax for fuel is five times the tax total of the individual automobile.

1957 Road Show

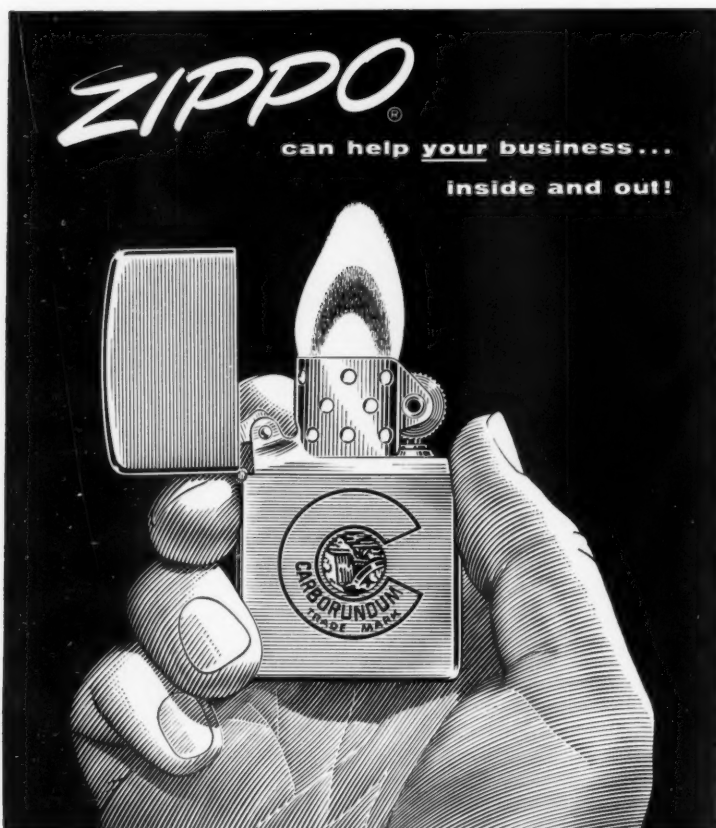
Plans for next year's ARBA Road Show were outlined by Kenneth Lindsay, president, manufacturers division, ARBA, (Construction Industry Manufacturers Association or CIMA). The show, to be held at the International Amphitheater, Chicago, January 28 through February 2, 1957, will take up an area of more than 300,000 square feet. This is only about one-third the area occupied by the last Road Show, which was held outdoors at Soldier Field in Chicago in the summer of 1948. Lindsay predicted that the 1957 indoor show would be better attended since contractors have more leisure time in the winter months than during a busy construction season. The CIMA head disclosed that the exhibit area was already 25 per cent over-subscribed and that cutbacks would be made to insure space for all concerned.

Technical sessions

Interest was high in the various technical sessions held during the convention. "Productivity of Engineering" was discussed by H. A. Radzikowski, chief, maintenance branch, U. S. Bureau of Public Roads, who outlined how the use of electronic devices in the building of roads relieved highway engineers of detailed tasks and reduced costs. The Bureau of Public Roads, according to Radzikowski, has assigned engineers to study the application of high-speed electronic computers to highway engineering operations, and to consult with industries as to the uses that have been and can be made of these machines. Some of the more important areas in which high-speed electronic computers can appreciably increase the productivity of engineers and supporting personnel are:

1. Traffic and planning
2. Sufficiency ratings of roads
3. Correlating accident rates with types of signs and signals
4. Determining the flow of water from a given drainage area
5. Bridge design
6. Computing earth quantities in highway location and design
7. Computing pay quantities, particularly earthwork in final estimates
8. Route and cadastral surveys

According to Henry Aaron, chief engineer of the Wire Reinforcement Institute's reinforced-concrete paving division, dollar savings and better performance are the basic reasons for distributed steel reinforcement in concrete pavements. In a paper "Welded Wire Fabric in Portland Ce-



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ment Concrete Pavements", Aaron stated that engineers have required steel reinforcement in over 93 per cent of all concrete turnpike pavements and 68 per cent of state highway concrete pavements.

Convention exhibit popular

A popular feature of the convention was a display of materials and supplies used in highway construction and maintenance. Some 55 exhibitors showed and demonstrated their products to the assorted gathering that included highway officials; representatives of national, international, state and local highway organizations; engineers; educators; insurance and finance specialists; contractors; materials suppliers; and equipment manufacturers and distributors. In addition to the commercial exhibitors, such governmental agencies as the U. S. Navy Bureau of Yards and Docks; U. S. Army Corps of Engineers; Department of the Air Force; U. S. Army Transportation Corps; Florida State Road Department; and Florida State Turnpike Authority were represented.

Hearst gets Bartlett Award

The George S. Bartlett Award, the highest honor for singular achievement in advancing better highways, was awarded at the opening session to William Randolph Hearst, Jr., chairman of the editorial board and publisher of the Hearst newspapers, of New York City. The presentation was made by L. L. "Tex" Colbert, president, Chrysler Corp., Detroit, Mich. In making the award to Hearst, Colbert declared that in his opinion "no other man in the country has done so much over the past three years to bring to the attention of the people of the United States the urgent and staggering needs of the nation for better highways". During that time, according to the motor car tycoon, the Hearst papers printed nearly three million lines on the highway problem, or enough to fill 1,229 full newspaper pages.

New executive vice president

ARBA president, John Robertson, who is director of highways of the District of Columbia, revealed the appointment of a new executive vice president for ARBA. He is Maj. Gen. Louis W. Prentiss, 56, who will retire from the U. S. Army on April 30 after a total of 35 years of military service. Since 1954 he has been in command of the Engineer Center at Ft. Belvoir, Va. His new appointment becomes effective May 1. He succeeds Lt. Gen. Eugene Reybold (USA Ret.), 71, who has been ARBA's executive vice president since 1950.

Besides Robertson and Prentiss, other ARBA officers for 1956 include: vice president northeastern district, Charles M. Noble, chief engineer, New Jersey Turnpike Authority, New Brunswick, N. J.; vice president southern district, Charles W. Smith, president, Smith Engineering and Construction Co., Pensacola, Fla.; vice president central district, Julien R. Steelman, president, Koehring Co., Milwaukee, Wis.; vice president west-

ern district, W. A. Bugge, director, Washington Department of Highways, Olympia, Wash. THE END

Vibro-Plus moves to N. J.

Vibro-Plus Products, Inc., manufacturer of vibratory compaction rollers and concrete-vibrating equipment, has moved its headquarters from Woodside, N. Y., to Stanhope, N. J. The firm will occupy a 23-acre tract of land formerly owned by the McDowell Co. of Cleveland.

Air force, army to use single engineer service

An agreement between the Department of the Army and the Department of the Air Force has abolished

all army engineer units working for the air force, and has returned these units to the operational control of the army. The departments have agreed, however, that the army will be responsible for providing overseas military construction to support the air force.

The agreement is expected to avoid duplication and insure effectiveness and economy in operations.

C & D Mfg. to operate as division of Yuba

The Yuba Mfg. Co., San Francisco, Calif., has acquired the C & D Mfg. Co., Perkins, Calif., and will operate the firm as a Yuba division. R. P. Nichols, former C & D sales manager, will be in charge of sales.

The chief product of the C & D firm is the Movall, a heavy-duty wagon with a positive ejector that pushes earth, mud, or frozen ore out through the rear of the wagon. Yuba had fabricated the wagons on a production-line basis under a contract with C & D.

Industrial building firms expect good business year

Speaking before the annual meeting of the National Constructors Association, T. C. Williams, president of the organization, declared that 1956 would be one of the best years ever experienced by this segment of the industry. One of the biggest factors sustaining the boom, he said, is the backlog of work in the field.



Wire Rope at Work — This is the skeleton of The Parkade, located on the Plaza, Camden, N. J. When finished, The Parkade will be an air-conditioned building with the wings of each floor reserved for offices. The center portion of all floors and the entire roof will be devoted to parking facilities, thus helping to alleviate a problem that has become acute in this part of the city. The Parkade is owned by the Nedmac Corporation; Terminal Construction Corporation is the builder.

The work of construction called for erecting 3500 tons of fabricated steel on a very tight schedule. One 60-ton and three 50-ton cranes were employed, each equipped with a 100-ft boom and Bethlehem wire rope. On any job of this nature Bethlehem rope is a tireless servant, willing and able. It proved so here. Bethlehem Purple Strand was used on all the lifts, and the hefty structural members were swung into place like matchsticks.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

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The Pioneer 35-S crushing plant is powered, through a close-coupled driveshaft, by a GM diesel engine. The ½-inch-minus material, turned out at a rate of about 60 tons per hour, is stockpiled, left, by an International TD-24 and dozer.

"Halfsole" resurfacing job reclaims a worn road

A total of 10,000 tons of ½-inch-minus crushed rock, produced from material with high crushing ratios and used in a halfsoleing job, has brought 11 miles of the main east-west transcontinental highway near Opal, Wyo., to topnotch condition for a relatively small sum.

This type of work, being done by the Wyoming State Highway Department to stretch highway dollars, supplements the modern four-lane plant-mix pavements being laid in the state. The halfsole asphalt penetration work has proved particularly suitable, provided traffic counts are not excessive, the existing highway roadbed is wide enough to accommodate present traffic, and the subbase is still in good condition. Where these conditions exist, a wavy road surface can often be restored to a smooth riding surface by halfsoleing.

Much of this work is still being done by state maintenance forces, but the recent trend has been toward letting long sections to contractors. The 11-mile job on U. S. 30 was done by Woodward Construction Co., Inc., Rock Springs, Wyo., which subcontracted the crushing assignment to J. A. McPherson & Co., Laramie, Wyo.

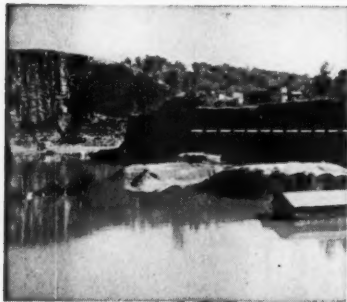
Woodward's job of leveling off the roughness in the existing roadway began with tacking the surface with a light coat of MC-0, applying a heavier coat of MC-3 asphalt, applying ½-inch-minus rock chips produced by McPherson, and then blading the rock with motor graders to

HOW TO HANDLE WET JOBS

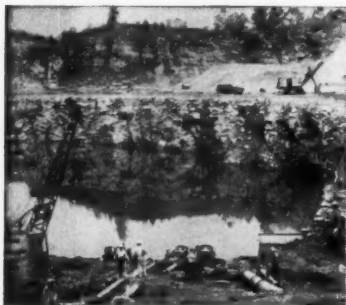
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HIT BY HURRICANE Diane, Martins Creek leaped its banks and flooded this quarry over 100 ft deep — shown by dotted line in photo.



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"Easy to transport," says Mac McVain.



"Well-built machine and a fast digger" says Jay Cundiff.

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Through Solid Rock At a Record Clip!

In Missouri they have an extremely hard, dense rock they call "Blue Flint." A contractor working at Grandview Air Force Base, given the task of breaking up a large amount of this rock, was having trouble finding a tool to do the job. Some tools "mushroomed," some dulled rapidly, some penetrated but didn't break the rock. Then he tried a Vulcan Superkut Chisel. In just one hour and 40 minutes, the Superkut Chisel dug 30 inches down through solid "Blue Flint" rock, over an area of ten square feet — 25 cubic feet of dense, solid rock broken up and removed, and the tool showed no signs of wear!

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Vulcan tools are sold by distributors throughout the United States and Canada



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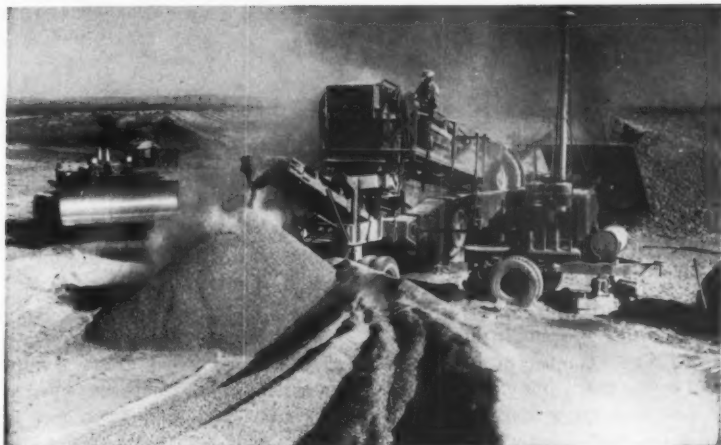
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CONTRACTORS AND ENGINEERS

Crusher reduction yields 10,000 tons of 1/2-inch-minus rock in three weeks for inexpensive 11-mile betterment work



Production of the finished rock specified meant that almost all the pit material, background, had to pass through the plant's 4 x 14-foot, 2 1/2-deck screen, the 10 x 36 jaw crusher, and the 24 x 30 roll crusher.

develop the smoothness required. A second treatment of MC-3, another application of rock, and additional blading were completed before steel-wheel and pneumatic rollers took over to compact the material, making the halfsole mat not greater than 1 1/2-inches thick, even in the thickest sections.

High production plant

The McPherson organization started its crushing assignment by setting up its new Pioneer 35-S gravel plant in a pit just off U. S. 30. This portable plant can be shifted in a pit in from 30 minutes to two hours, and can be taken down and made ready for road travel in less than two hours. The over-the-road speed for the 54,000-pound plant is about 25 mph.

Before starting on this job, the plant had already demonstrated its capacity for high tonnages on heavier assignments. Among them was a 30,000-ton job on 3/4-inch-minus material, which the plant had turned out at a rate of 168 tons per hour at Saratoga, Wyo. It had also produced 43,000 tons of 3/4-inch material at Sinclair, and had finished 40,000 tons of the same material in a pit near Opal.

It had also shown that it could average up to 400 tons of 2-inch-minus material per hour, about 290 tons of 1-inch-minus material per hour, and about 200 tons of 3/4-inch material per hour, even when the

(Continued on next page)



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The "CONSTRUCTION CRUISER"

(Hydraulic concrete carrier and dozier)

See EDITORIAL ON PAGE 61 for details !!!

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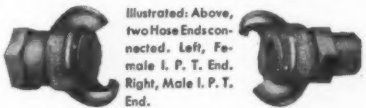
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Weather charts

The weather outlook for March

The two accompanying charts indicate the weather conditions that can be expected throughout the United States during the month of March. Showing the number of days with rainfall and the number of days with temperatures lower than 32 degrees, the charts indicate only average conditions and are not specific forecasts.

In Chart I, areas indicated as dry will have on an average of fewer than 8 days of rainfall during the month. Medium regions will have between 8 and 12 rainy days; and an average of more than 12 days of rainfall can be expected in the wet areas.

Areas indicated on Chart II as being warm will average fewer than 8 days of below-freezing temperatures during March. Medium areas will have between 8 and 16 below-freez-

ing days, while cold areas will experience 16 or more days when the temperature will drop below 32 degrees.

These charts also can be used in a relative sense. From Chart I, contractors can see that the weather will permit more work to be done in Salina, Kans., Oklahoma City, Okla., and Omaha, Nebr., than in Lexington, Ky., New York City, or Roanoke, Va. Better weather is expected, too, in western Arkansas than in eastern Tennessee, since Arkansas is closer to the dry area.

Further information about these charts or data or other uses of applied climatology can be obtained from the Weather Corp. of America, with offices at 39 Broadway, New York, N. Y., and 611 Olive St., St. Louis, Mo.

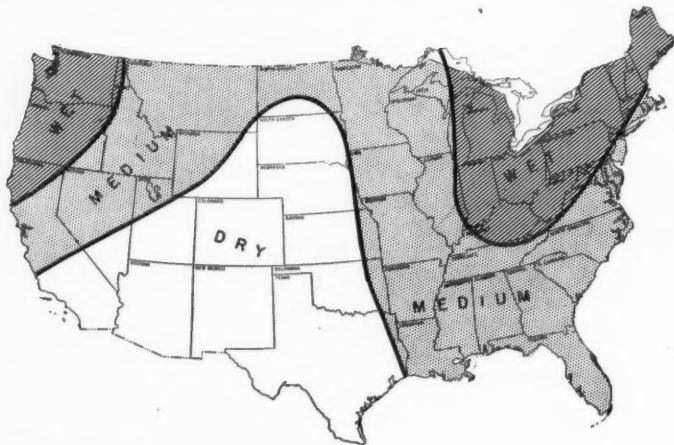


Chart I: Precipitation

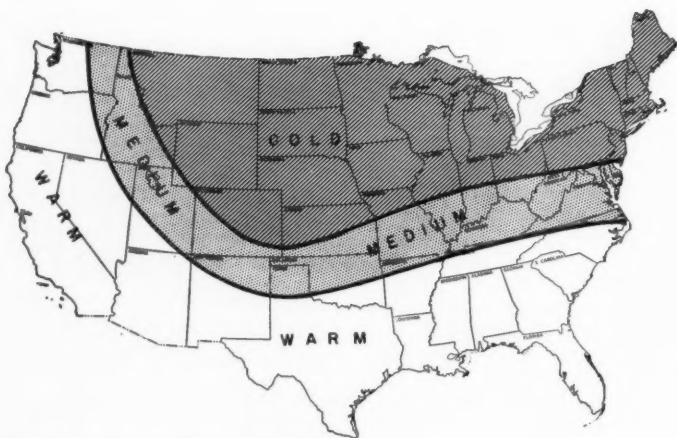


Chart II: Temperatures 32 degrees or lower.

(Continued from preceding page)

crushing ratio was high. And on this halfsole job, the crushing ratios were extremely high.

Practically all pit material had to pass through the jaws and rolls of the crusher before moving out to the stockpile, but despite the near 100 per cent crushing ratio, the plant completed the 10,000-ton job in about three weeks, with few slowdowns and no shutdowns.

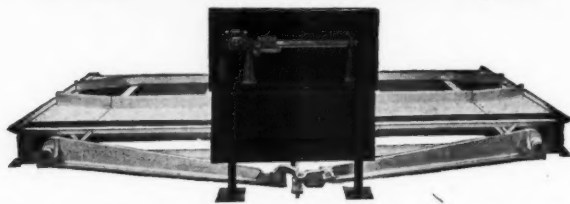
Rock-pit material, typical of that found above the 6,000-foot level in Wyoming, consisted of well-graded,

rocky cobbles ranging up to 4 inches in size. All particles were well rounded. A Caterpillar D8 with dozer shoveled this material to the plant, and the 60 tons of finished product turned out hourly was shoved into a stockpile by an International TD-24.

The plant's principal source of power is a General Motors 6-71 diesel engine with a close-coupled drive-shaft, a type of drive that seems less vulnerable to the sudden afternoon rains that commonly drench this area. Flat-belt drives often jump drive pulleys under similar conditions.

(Concluded on next page)

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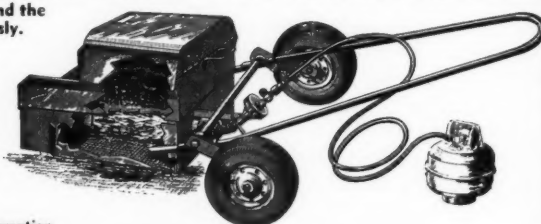
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GIVE TO CONQUER Cancer

CONTRACTORS AND ENGINEERS



Recipients of the Roy W. Crum Award for achievement in research are, left to right, Stanton Walker, Director of Engineering, National Sand & Gravel Association; Earl F. Kelley, Chief, Physical Research Branch, USBPR; and Tilton E. Shelburne, Director of Research, Virginia Department of Highways. The awards were conferred at the annual meeting.

The annual award for an outstanding technical paper was given to Carl C. Saal, Bureau of Public Roads.

Top HRB awards go to highway engineers

The Highway Research Board's Roy W. Crum award for outstanding research achievement, usually given to one person annually, was presented to three men at the opening session of the board's annual meeting in Washington, D. C., on January 17.

The three winners are Earl F. Kelley, chief of the Physical Research Branch of the U. S. Bureau of Public Roads; Tilton E. Shelburne, director of research of the Virginia State Department of Highways; and Stanton Walker, director of engineering of the National Sand & Gravel Association.

Also at the opening session, Carl C. Saal, chief of the vehicle operations section of the USBPR, was given the HRB's annual award for his outstanding technical paper, "Operating Characteristics of a Passenger Car on Selected Routes," which was delivered at last year's meeting of the board.

The Roy W. Crum awards cited the achievements of the three men honored this year. Kelley was recognized for his contributions to highway engineering, including his development, through the USBPR, of a system of identifying and classifying soils for

engineering purposes and his work in research on the aerodynamic behavior of suspension bridges.

Shelburne was honored for his work in the field of joint state and state-university sponsorship of highway research. Walker's award mentioned his activity in the development of concrete technology, in which he has been engaged for about 40 years, together with his accomplishments in research, education, and the development of specifications and test methods for concrete and aggregates. He was chairman of HRB in 1944-45.

(Continued from preceding page)

The plant components include a 2½-deck screen 4×14 feet, a 10×36 jaw crusher, and a set of 24×30 roll crushers. The pit material was routed through these components in a continuous circuit to produce the ½-inch minus crushed rock.

In spite of the heavy crushing and sizing done to date, the plant's original jaws are still in service and the roll crushers have required only light welding with a Resisto-Loy rod.

Special features

A special trap and feeder developed

eight years ago by general superintendent L. H. Acord, is a unique feature of the plant. The feeder takes only a short time to set up, remains trouble-free while the plant is operating, and is flexible enough to meet any type of feeding condition. Carrier rollers, a 30-inch conveyor belt, and stock steel shapes for building up the frame of the unit are the only things Acord purchased when he built the feeder. The back wall of the feeder is wedge-shaped, and its sturdy frame facilitates rapid handling by the drawbar of one of the tractors.

One of its unusual applications was on a maintenance stock-

piling job, where the work consisted of screening very fine pit material. For this, Acord rigged up the unit in the conventional manner, but suspended a Pioneer buzzer screen between the feed conveyor and the ground. The single deck of the buzzer screen scalped off all rock larger than that specified. By using two decks on the buzzer, Acord produced two sizes of material, while oversize was being rejected. The feeder has worked so well and aroused so much interest that Acord has used off seasons to turn out eight others for different contractors.

THE END

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Surveying Washington

This session of Congress is likely to produce more noise than action. Legislators are face to face with construction measures that would be controversial even in a non-election year. In a presidential election year, they are explosive.

To make things more difficult, last year's friendly aura of bipartisanship has evaporated, and both parties are working to crystallize campaign issues for the voters. Leaders on both sides of the aisle continue to give lip service to bipartisan aims, but this is little more than talk. Unfortunately, Congress is shrugging away Administration leadership without substi-

tuting much leadership of its own. Without firm guidance by someone, House and Senate may get tied up in factional disputes.

Added to this is the fact that the Congressional workload for 1956 is simply staggering. Thousands of bills have been carried over from the first session and hundreds of new bills hit the hopper each day last month. The technical difficulties of reading, assigning, scheduling, and holding hearings on these measures alone could easily delay important action.

Despite this gloomy outlook, a long-range highway bill for a new inter-

by HUBERT KELLEY, Jr.

state system stands a good chance of making the grade. The House Public Works Committee planned to put highways near the top of its agenda and decided that additional public hearings, if any, would be brief.

This year, the committee's job will be less forbidding, with deliberations limited to a bill authorizing completion of the federal road network. The knotty problem of how to raise money to pay for the roads has been left to Ways and Means, and that committee is expected to introduce its tax plan as an amendment to the roads bill.

The major highway wrangle, of course, must be settled by Ways and Means. Principal bills under consideration would finance roads by upping the federal tax on gasoline and diesel fuel one cent, and raising excises on tires, tubes, tread rubber, and new trucks and buses. There have been hints that oil and gas interests have softened their opposition to a hike in gas levies, but tire and trucking spokesmen are likely to continue the fight against higher excises.

Most congressmen sense that the majority of voters want a compre-

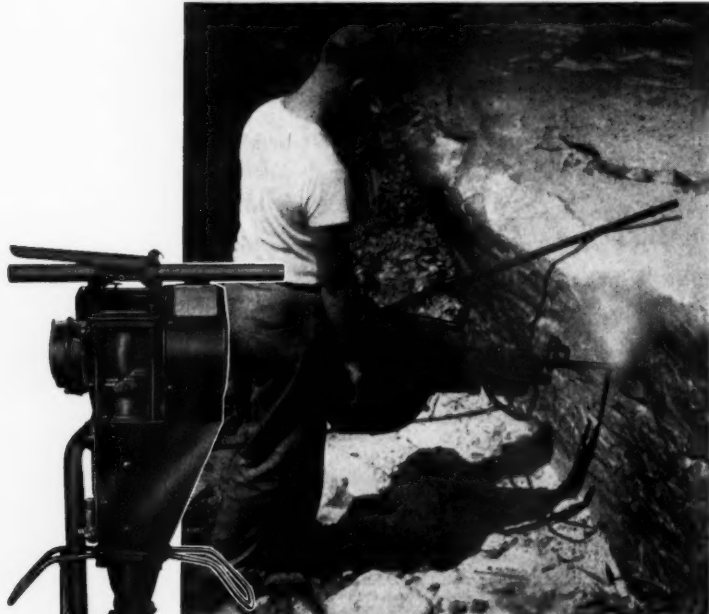
hensive road program, no matter how it is financed. It is one national issue which is a matter of personal concern to every motorist, and this fact alone should bring decisive action in this election year.

A number of other issues are also involved in the swirl of proposed road legislation. Speakers for contractors in the capitol continue to press for some sort of long-range program so that builders will know how much to invest in additional equipment, material, and personnel. Contractors also oppose the inclusion of wage rates set by the Secretary of Labor in any highway legislation. All the House bills introduced last year provided that the Davis-Bacon Act would apply to projects on the interstate system, tying wages to prevailing rates in the construction area. This provision was struck out of the Senate-approved Gore bill.

Bitter Congressional disputes like the Hell's Canyon fight are going to reflect, more than ever, the imbalance of water supply and water demand in our western states. Involved in this dispute is water from the

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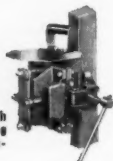
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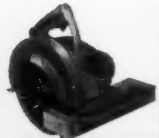
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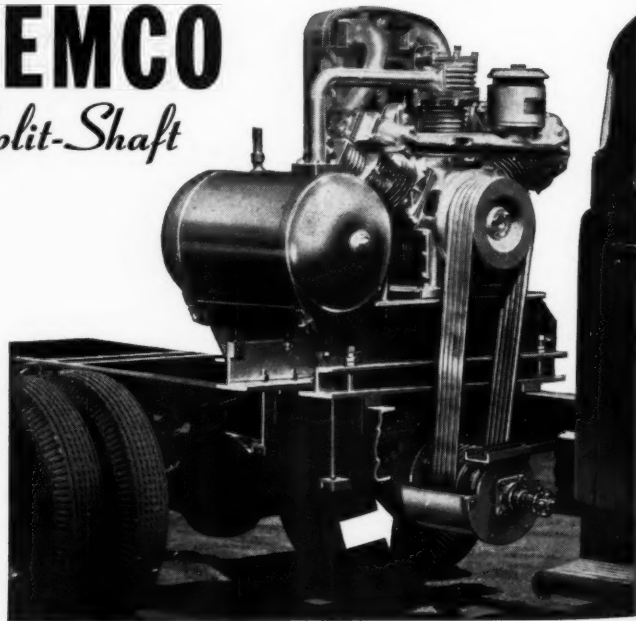
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**CEMCO INDUSTRIES, INC.,
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 383

CONTRACTORS AND ENGINEERS

Snake River, which irrigates nearly three million acres of land in Idaho before the stream winds through deep Hell's Canyon and flows into the Columbia. Democrats, following a plan originally devised by the Truman Administration, want to build one \$400 million dam in Hell's Canyon, sell the electric power it provides, and irrigate an area called Mountain Home with the proceeds.

The Eisenhower Administration favors a "power partnership" with the Idaho Power Co., which wants to build several smaller dams on the Snake River. Supporters of this plan believe federal ownership of the project might someday permit the government to cut down on the water used for irrigation in Idaho. Local or state control of the power projects, on the other hand, would insure that the use of water for irrigation would always have preference over water used for power.

The administration also believes that there is no point in saddling the American taxpayers with the cost of a regional power project if private funds can do the job at less expense.

But Senators Wayne Morse (D., Oreg.) Richard Neuberger, (D., Oreg.) and Rep. Gracie Pfof, (D., Idaho) are sponsoring bills to authorize the high federal dam, charging that the Idaho Power plan will fail to develop the full power resources of the river.

Meanwhile, the Idaho Power Co. won a second round in the fight when the Federal Power Commission, which had already approved exhibits for two of its proposed dams, denied a petition of public power groups to set aside its decision.

As the Hell's Canyon battle moves into the open in hearings in the Interior and Insular Affairs Committees, at least two conflicts will take place—one between backers of federal power and proponents of power partnerships, the other between farm-irrigation interests and advocates of more electric power.

Proposed flood-control measures will keep both the House and Senate busy. Following the highway problem on the House Public Works agenda will be an omnibus river and harbor flood-control bill. Bills have been introduced to license the New York State Power Authority to construct and operate the Niagara River power project, and other bills introduced propose to turn the whole project over to the Niagara Mohawk Authority.

Measures by the score have been introduced by legislators from flood-stricken states. Some of these are for temporary projects, some for long-range flood-control programs, and some for disaster insurance. One bill calls for the establishment of a Northeastern Watershed Development and Flood Protection Commission, and would be aimed at protecting the region against floods and hurricanes.

Not every Washington debate will take place in Congress this year. The Federal Power Commission, an inde-

pendent regulatory agency, faces the most controversial and complicated case in its history during 1956.

This case involves applications of Tennessee Gas Transmission Co., and its subsidiary, Midwestern Gas Transmission, to build a \$98 million, 1,760-mile natural gas pipeline from Tennessee to Manitoba. Midwestern wants to import gas from the projected Trans-Canada line and from Tennessee's southern U. S. lines and sell the two-way supply to midwest utilities.

The route of the line challenges the present and future markets of some of the biggest competing pipeline companies in America and makes the case the first giant conflict of market interests ever presented to the five power commissioners. Some of the markets at stake include Duluth, Minn.; Superior, Wis.; and Chicago, Ill.

Almost every major gas company and coal and rail interest has intervened in the case, and this gives their attorneys the right to cross-examine

witnesses. Most observers think hearings will last from two to three years, since skilled corporation lawyers are expected to be on their mettle.

Senator Paul H. Douglas, (D., Ill.) recently completed a four-day speech attacking a pending bill that would end direct Federal control of prices charged by producers of natural gas, and at the same time regulating the rates of interstate pipeline companies. Other senators have yet to be heard on the issue; however, there is no threat of a filibuster, just a debate.



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- 2 Maximum dependability with minimum good care.**
- 3 Operators prefer Cat power to work with."**

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Maxwell Bridge Co.**

Those three reasons tell why Maxwell Bridge Co., of Columbus, Kansas, powers its cranes and excavators with Caterpillar Diesel Engines. The Koehring Crane shown here, placing I-beams for a bridge 5 miles west of Emporia, is one of 12 machines owned by Maxwell. Its engine? A Caterpillar D318, with well over 4000 hours on the meter.

Operators who have worked for this company from 8 to 25 years are particular about their power. Busy all year around, each man services his own machine. Naturally they want an engine that stays on the job without tinkering—and when they're asked to name their preference, they choose Caterpillar.

Most manufacturers of excavating equipment can supply Cat Diesels as original power. Or Caterpillar Dealers are ready to install these dependable engines

as replacement power. A full line of engines is available. The D318, for example, is rated at 137 HP (maximum) at 2000 RPM.

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Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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Strips 3600 yds. of asphalt in 8 hours with two Michigan 175A Tractor Shovels

More and more contractors are finding that Michigan Tractor Shovels will handle jobs that have always been considered too tough for rubber-tired equipment. Here's a case in point. C. J. Wilson, Chicago contractor, fitted 1-inch steel scarifier teeth to one of his two Michigan 175A Tractor Shovels to remove 3½ miles of old asphalt on two four-lane streets.

The asphalt surface averaged 3 to 4-inches thick, up to 9-inches at some intersections—a mixture of asphalt, limestone dust, stones up to 1-inch diameter

C. J. Wilson inspects the 1" steel scarifier teeth he installed on his Michigan 175A.

and chunks of concrete—average weight about 3200 lbs. per yard. Wilson found that his two Michigans handled the job 70% faster than a crawler-loader and one Michigan.

Used crawler and Michigan

Before he decided to use the scarifier, Wilson used a crawler-loader to cut and scrape the asphalt and loaded it with a 2¼-yard Michigan 175A. This method produced oversized hunks of asphalt up to 20 ft. square which had to be broken up before they could be loaded out. When the weather was hot, the "breaking-up" chore was stubborn and time-consuming. Furthermore, the crawler tracks damaged the macadam base.

Michigans scarify and load

With the heavy-duty scarifier teeth on the Michigan, Wilson found that he could cut the asphalt into strips as much as a block long. The teeth engage when the bucket is dragged backwards with down-pressure to hold them in the asphalt. On the forward pass, they retract automatically and do not interfere with normal use of the bucket.

The two 2¼ yd. Michigans worked a tandem operation. One did all the cutting so fast that it doubled back to assist

the other machine which spent full time loading and cleaning-up. Production was as high as 3800 yds. in 8 hours, averaged 3600 yds.—compared to 2100 yds. a day the old way.

Handles tough jobs on rubber

Like C. J. Wilson, many other Michigan owners are finding that this Tractor Shovel will actually improve production on jobs which have never even been tried on rubber. The complete power-train—torque converter, power-shift transmission, planetary axles—was designed and built entirely by Clark, specifically engineered to give this machine more useable power and traction than you've ever seen on rubber. For proof, ask your Michigan distributor to demonstrate. You name the job!

Michigan is a trade-mark of Clark Equipment Co.
CLARK EQUIPMENT COMPANY
 Construction Machinery Division
 2407 Pipestone Road
 Benton Harbor 7, Michigan

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